Hardware and Software Guide

HP Compaq Notebook Series

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This guide explains how to identify and use the notebook hardware features, including connectors and external devices. It also includes security, software, and specification information.

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1

Notebook Features

This chapter describes hardware and software features of the notebook.

✎ Components included with your notebook may vary by geographical region and by model. The illustrations in this chapter identify the standard external features included in most notebook models. Refer to the illustrations that most closely match your notebook.

Top Components

Lights

✎ Refer to the illustration that most closely matches your notebook.

	Component	Description
❶	Power/standby light	Green: The notebook is on.
		Blinking green: The notebook is in standby mode.
		Off: The notebook is off or in hibernation.
❷	Wireless lights (2)	On: An integrated wireless device, such as a wireless LAN device and/or a Bluetooth® device is turned on.

(Continued)

Component	Description
❸ Power/standby light	Green: The notebook is on.
	Blinking green: The notebook is in standby mode.
	Off: The notebook is off or in hibernation.
❹ Battery light	Amber: A battery pack is charging.
	Green: A battery pack is close to full charge capacity.
	Blinking amber: A battery pack that is the only available power source has reached a low-battery condition. When the battery reaches a *critical* low-battery condition, the battery light begins blinking more quickly.
	Off: If the notebook is connected to an external power source, the light is turned off when all batteries in the notebook are fully charged. If the notebook is not connected to an external power source, the light is turned off until the battery reaches a low-battery condition.
❺ IDE (Integrated Drive Electronics) drive light	Blinking: The hard drive or optical drive is being accessed.
❻ Volume mute light	On: System sound is turned off.
❼ Num lock light	On: Num lock is on or the embedded numeric keypad is enabled.
❽ Caps lock light	On: Caps lock is on.

Component		Description
❶	Power/standby light	Green: The notebook is on.
		Blinking green: The notebook is in standby mode.
		Off: The notebook is off or in hibernation.
❷	Wireless lights (2)	On: An integrated wireless device, such as a wireless LAN device and/or a Bluetooth device is turned on.
❸	Power/standby light	Green: The notebook is on.
		Blinking green: The notebook is in standby mode.
		Off: The notebook is off or in hibernation.

(Continued)

	Component	Description
❹	Battery light	Amber: A battery pack is charging.
		Green: A battery pack is close to full charge capacity.
		Blinking amber: A battery pack that is the only available power source has reached a low-battery condition. When the battery reaches a *critical* low-battery condition, the battery light begins blinking more quickly.
		Off: If the notebook is connected to an external power source, the light is turned off when all batteries in the notebook are fully charged. If the notebook is not connected to an external power source, the light is turned off until the battery reaches a low-battery condition.
❺	IDE drive light	Blinking: The hard drive or optical drive is being accessed.
❻	Num lock light	On: Num lock is on or the embedded numeric keypad is enabled.
❼	Caps lock light	On: Caps lock is on.

TouchPad
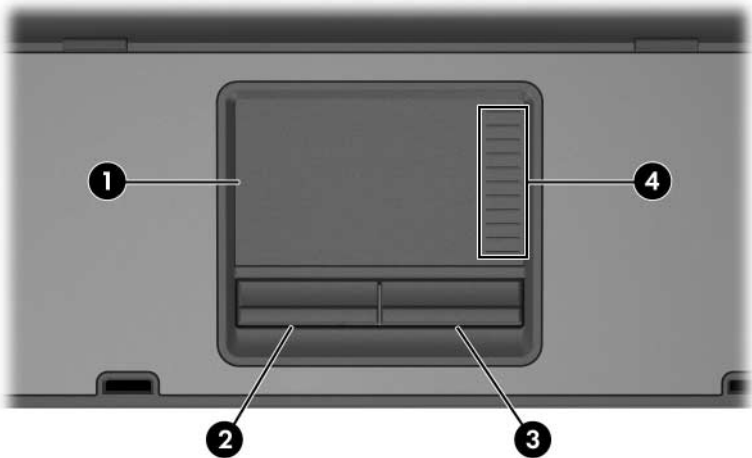
Component	Description
❶ TouchPad*	Moves the pointer and selects or activates items on the screen. Can be set to perform other mouse functions, such as scrolling, selecting, and double-clicking.
❷ Left TouchPad button*	Functions like the left button on an external mouse.
❸ Right TouchPad button*	Functions like the right button on an external mouse.
❹ TouchPad scroll zone*	Scrolls upward or downward.

*This table describes default settings. For information about changing the functions of TouchPad features, see the "Setting TouchPad Preferences" section in Chapter 3, "TouchPad and Keyboard."

Buttons and Switches

✎ Refer to the illustration that most closely matches your notebook.

Component	Description
❶ Power button*	When the notebook is:
	■ Off, press the button to turn on the notebook.
	■ In standby, briefly press the button to exit standby.
	■ In hibernation, briefly press the button to exit hibernation.
	If the notebook has stopped responding and Microsoft® Windows® shutdown procedures cannot be used, press the power button and hold for 5 seconds to turn off the notebook.

(Continued)

	Component	Description
❷	Display switch	Puts the notebook in standby if the display is closed while the notebook is turned on.
❸	Info Center button	Launches Info Center. Refer to "Using Info Center (Select Models Only)" in Chapter 4, "Multimedia" for more information.
❹	Wireless button*	Turns the wireless functionality on or off, but does not create a wireless connection. ✎ To establish a wireless connection, a wireless network must already be set up. For more information about establishing a wireless connection from Windows, visit http://www.hp.com/go/wireless.
❺	Presentation mode button	Turns on Presentation mode.
❻	Volume mute button	Mutes system sound.
❼	Volume down button	Decreases system volume.
❽	Volume up button	Increases system volume.

*This table describes default settings. For information about changing the functions of power features, see the "Power Preferences" section in Chapter 2, "Power." For information about changing the functions of wireless features, see Chapter 6, "Wireless."

Component	Description
❶ Power button*	When the notebook is: ■ Off, press the button to turn on the notebook. ■ In standby, briefly press the button to exit standby. ■ In hibernation, briefly press the button to exit hibernation. If the notebook has stopped responding and Microsoft® Windows® shutdown procedures cannot be used, press the power button and hold for 5 seconds to turn off the notebook.

(Continued)

Component		Description
❷	Display switch	Puts the notebook in standby if the display is closed while the notebook is turned on.
❸	Wireless button*	Turns the wireless functionality on or off, but does not create a wireless connection.
		✎ To establish a wireless connection, a wireless network must already be set up. For more information about establishing a wireless connection from Windows, visit http://www.hp.com/go/wireless.

*This table describes default settings. For information about changing the functions of power features, see the "Power Preferences" section in Chapter 2, "Power." For information about changing the functions of wireless features, see Chapter 6, "Wireless."

Keys

✎ Your notebook may look slightly different from the illustration in this section.

	Component	Description
❶	Function keys	Execute frequently used system functions when pressed in combination with the **fn** key.
❷	**fn** key	Executes frequently used system functions when pressed in combination with a function key or the **esc** key.
❸	Windows logo key	Displays the Microsoft Windows Start menu.
❹	Windows applications key	Displays a shortcut menu for items beneath the pointer.
❺	Keypad keys	Can be used like the keys on an external numeric keypad.

Front Components

✎ Refer to the illustration that most closely matches your notebook.
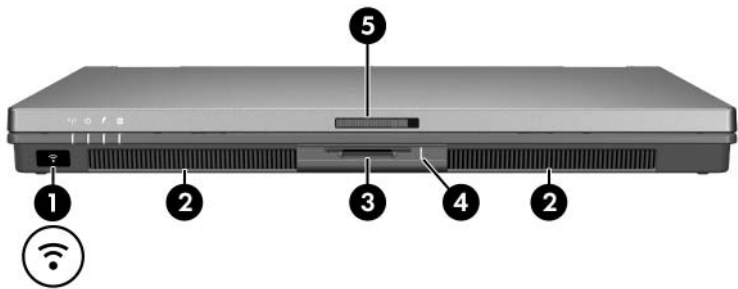
	Component	Description
❶	Infrared port	Provides wireless communication between the notebook and an optional IrDA-compliant device.
❷	Speakers (2)	Produce notebook sound.
❸	6-in-1 Digital Media Slot (select models only)	Supports 6 optional digital memory card formats: SD (Secure Digital) Memory Card, MultiMediaCard, Memory Stick, Memory Stick Pro, SmartMedia, and xD-Picture Card.
❹	6-in-1 Digital Media Slot light (select models only)	On: Slot is accessing a digital memory card.
❺	Display release latch	Opens the notebook.
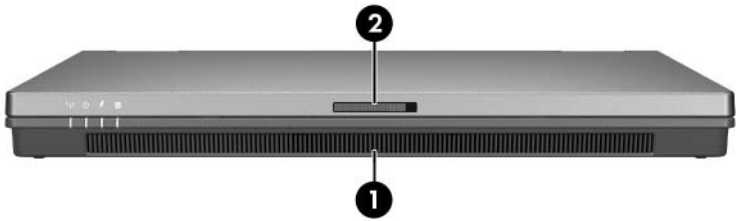
Component		Description
❶	Speaker	Produce notebook sound.
❷	Display release latch	Opens the notebook.

Wireless Antennae (Select Models Only)

⚠️ **WARNING: Exposure to Radio Frequency Radiation.** The radiated output power of this device is below the FCC radio frequency exposure limits. Nevertheless, the device should be used in such a manner that the potential for human contact during normal operation is minimized. To avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antennae should not be less than 20 cm (8 inches) during normal operation, including when the notebook display is closed.

On select notebook models, there are 2 wireless antennae that send and receive wireless device signals. They are not visible from the outside of the notebook.

✎ Your notebook may look slightly different from the illustration in this section.

Rear Components

✎ Refer to the illustration that most closely matches your notebook.

Component		Description
❶	Security cable slot	Attaches an optional security cable to the notebook.
		⚠ Security solutions are designed to act as deterrents. These deterrents may not prevent a product from being mishandled or stolen.
❷	Power connector	Connects an AC adapter or an optional automobile or aircraft adapter.
❸	Parallel port	Connects an optional printer.
❹	S-Video-out jack	Connects an optional S-Video device such as a television, VCR, camcorder, overhead projector, or video capture card.

	Component	Description
❶	Security cable slot	Attaches an optional security cable to the notebook.
		⚠ Security solutions are designed to act as deterrents. These deterrents may not prevent a product from being mishandled or stolen.
❷	Power connector	Connects an AC adapter or an optional automobile or aircraft adapter.

Right-Side Components

✎ Refer to the illustration that most closely matches your notebook.

	Component	Description
❶	Audio-out (headphone) jack	Produces system sound when connected to optional powered stereo speakers, headphones, headset, or television audio.
❷	Audio-in (microphone) jack	Connects an optional stereo or monaural microphone.
❸	USB ports (2)	Connect USB 1.1- and 2.0-compliant devices to the notebook using a standard USB cable, or connect an optional External MultiBay II to the notebook. The MultiBay II must also be connected to an external power source.
❹	Optical drive	Holds an optical disc.
❺	Optical drive button	Ejects an optical disc.
❻	Serial port	Connects an optional serial device.
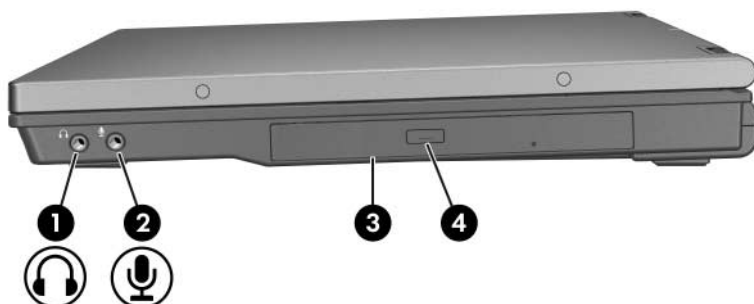
	Component	Description
❶	Audio-out (headphone) jack	Produces system sound when connected to optional powered stereo speakers, headphones, headset, or television audio.
❷	Audio-in (microphone) jack	Connects an optional stereo or monaural microphone.
❸	Optical drive	Holds an optical disc.
❹	Optical drive button	Ejects an optical disc.

Left-Side Components

✎ Refer to the illustration that most closely matches your notebook.

Component		Description
❶	USB ports (2)	Connect USB 1.1- and 2.0-compliant devices to the notebook using a standard USB cable, or connect an optional External MultiBay II to the notebook. The MultiBay II must be connected to an external power source.
❷	External monitor port	Connects an external monitor.
❸	RJ-11 (modem) jack	Connects a modem cable.
❹	RJ-45 (network) jack	Connects a network cable.
❺	1394 port	Connects an optional IEEE 1394 device, such as a camcorder.
❻	PC Card slots (2)	Support optional Type I, Type II, or Type III 32-bit (CardBus) or 16-bit PC Cards.
❼	PC Card slot eject buttons (2)	Eject PC Cards from the PC Card slots.

	Component	Description
❶	USB ports (2)	Connect USB 1.1- and 2.0-compliant devices to the notebook using a standard USB cable, or connect an optional External MultiBay II to the notebook. The MultiBay II must be connected to an external power source.
❷	External monitor port	Connects an external monitor.
❸	RJ-11 (modem) jack	Connects a modem cable.
❹	RJ-45 (network) jack	Connects a network cable.
❺	1394 port	Connects an optional IEEE 1394 device, such as a camcorder.
❻	PC Card slot (1)	Supports optional Type I, Type II, or Type III 32-bit (CardBus) or 16-bit PC Cards.
❼	PC Card slot eject button (1)	Ejects a PC Card from the PC Card slot.

Bottom Components

✎ Refer to the illustration that most closely matches your notebook.
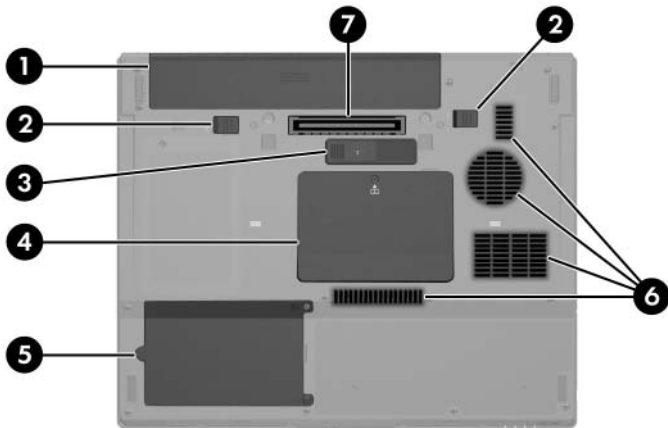
	Component	Description
❶	Primary battery bay	Holds the primary battery pack.
❷	Primary battery release latches (2)	Releases the primary battery pack from the battery bay. The primary battery locking latches must be in the unlocked position.
❸	Travel battery connector	Connect an optional travel battery.
❹	Expansion memory module compartment	Contains the expansion memory module slot.

(Continued)

	Component	**Description**
❺	Hard drive bay	Holds the hard drive.
❻	Vents (4)	Enable airflow to cool internal components.
		⚠ To prevent overheating, do not obstruct vents. Using the notebook on a soft surface, such as a pillow, blanket, rug, or thick clothing, may block airflow.
❼	Docking connector	Connect the notebook to an optional docking device.

Component		Description
❶	Primary battery bay	Holds the primary battery pack.
❷	Primary battery release latches (2)	Release the primary battery pack from the battery bay. The primary battery locking latches must be in the unlocked position.
❸	Travel battery connector	Connects an optional travel battery.
❹	Expansion memory module compartment	Contains the expansion memory module slot.
❺	Hard drive bay	Holds the hard drive.
❻	Vents (4)	Enable airflow to cool internal components.
		$\triangle$ To prevent overheating, do not obstruct vents. Using the notebook on a soft surface, such as a pillow, blanket, rug, or thick clothing, may block airflow.

Additional Hardware Components
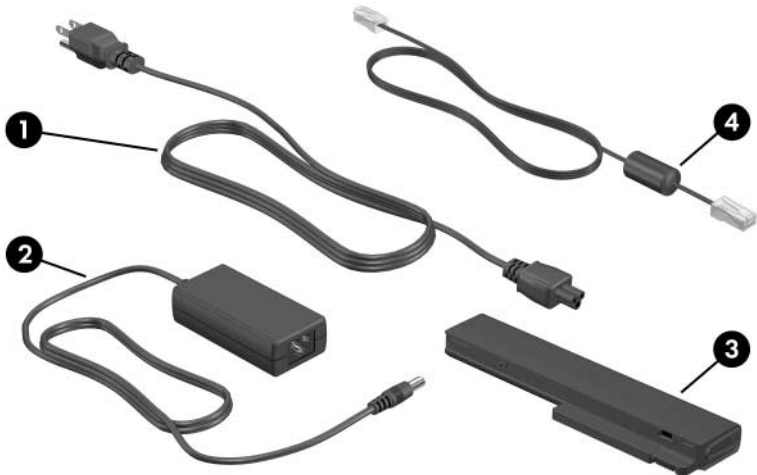
Component		Description
❶	Power cord*	Connects an AC adapter to an AC Outlet.
❷	AC adapter	Converts AC power to DC power.
❸	Primary battery pack	Powers the notebook when the notebook is not connected to external power.
❹	Modem cable* (select models only)	Connects an internal modem to an RJ-11 telephone jack or to a country-specific modem adapter.

*Modem cables and power cords vary in appearance by region and country. Battery packs vary by model.

2

Power

Power Control and Light Locations

The following illustration and table identify and describe the power control and light locations.

✎ Your notebook may look slightly different from the illustrations in this section.

Component	Description
❶ Power/standby light	Green: The notebook is on.
	Blinking green: The notebook is in standby mode.
	Off: The notebook is off or in hibernation.
❷ Power button*	When the notebook is:
	■ Off, press the button to turn on the notebook.
	■ In standby, briefly press the button to to exit standby.
	■ In hibernation, briefly press the button to exit hibernation.
	If the notebook has stopped responding and Microsoft Windows shutdown procedures cannot be used, press the power button and hold for 5 seconds to turn off the notebook.

(Continued)

Component		Description
❸	Power/standby light	Green: The notebook is on.
		Blinking green: The notebook is in standby mode.
		Off: The notebook is off or in hibernation.
❹	Battery light	Amber: A battery pack is charging.
		Green: A battery pack is close to full charge capacity.
		Blinking amber: A battery pack that is the only available power source has reached a low-battery condition. When the battery reaches a *critical* low-battery condition, the battery light begins blinking more quickly.
		Off: If the notebook is connected to an external power source, the light is turned off when all batteries in the notebook are fully charged. If the notebook is not connected to an external power source, the light is turned off until the battery reaches a low-battery condition.
❺	**fn+f3**	Initiates standby.
❻	Display switch	Puts the notebook in standby if the display is closed while the notebook is turned on.

Selecting a Power Source

The notebook can run on internal or external AC power. The following table indicates the best power sources for common tasks.

Task	Recommended Power Source
Work in most software applications	■ Charged battery pack in the notebook ■ External power supplied through one of the following devices: ❐ AC adapter ❐ Optional docking device (select models only) ❐ Optional automobile or aircraft adapter
Charge or calibrate a battery pack in the notebook	External power supplied through ■ AC adapter ■ Optional docking device (select models only) ■ Optional automobile or aircraft adapter
Install or modify system software or write to a CD	External power supplied through ■ AC adapter ■ Optional docking device (select models only) ■ Optional automobile or aircraft adapter

Standby and Hibernation

Standby and hibernation are energy-saving features that conserve power and reduce startup time. They can be initiated by you or by the system. Refer to the "Initiating Standby, Hibernation or Shutdown" section in this chapter for details about when to use each setting.

Standby

⚠ **CAUTION:** To avoid a complete battery discharge, do not leave your notebook in standby for extended periods. Connect the notebook to an external power source.

Standby reduces power to system components that are not in use. When standby is initiated, your work is saved in random access memory (RAM) and the screen is cleared. When you resume from standby, your work returns to the screen where you left off.

■ Saving your work before initiating standby is not usually necessary, but it is a recommended precaution.

■ When the notebook is in standby, the power/standby lights flash.

Hibernation

⚠ **CAUTION:** If the configuration of the notebook is changed during hibernation, resuming from hibernation may not be possible. When the notebook is in hibernation:

■ Do not dock or undock the notebook in a docking device.

■ Do not add or remove memory modules.

■ Do not insert or remove any hard drives.

■ Do not connect or disconnect external devices.

■ Do not insert or remove a PC Card or a digital memory card.

Hibernation saves your work to a hibernation file on the hard drive, and then shuts down the notebook. When you restore from hibernation, your work returns to the screen where you left off. If a power-on password has been set, the password must be entered to restore from hibernation.

You can disable hibernation. However, if hibernation is disabled and the system reaches a low-battery condition, the system will not automatically save your work while power is on or when standby has been initiated.

In the Power Options window, hibernation is not displayed as an option if it has been disabled. You must enable hibernation in order to select it in the Power Options window.

To verify that hibernation is enabled:

» Select **Start > Control Panel > Performance and Maintenance > Power Options > Hibernate** tab. Make sure that the **Enable hibernate support** check box is selected.

Initiating Standby, Hibernation or Shutdown

The following sections explain when to initiate standby or hibernation and when to shut down your notebook.

When You Leave Your Work

Initiating standby clears the screen and uses less power than leaving the notebook on. Your work returns instantly to the screen when you resume from standby.

Initiating hibernation clears the screen, saves your work to the hard drive, and uses much less power than standby.

Shutting down the notebook and removing the battery pack is recommended to extend the life of the battery pack when the notebook will be disconnected from external power for an extended period. For details on battery pack storage, refer to the "Storing a Battery Pack" section in this chapter.

When the Power Supply Is Uncertain

Make sure that hibernation remains enabled, especially if you are operating the notebook on battery power and do not have access to an external power supply. If the battery pack fails, hibernation saves your work to a hibernation file and shuts down the notebook.

It is recommended that if you pause your work when the power supply is uncertain, you do one of the following:

- Initiate hibernation.
- Shut down the notebook.
- Save your work, and then initiate standby.

When Using Infrared Communication or Drive Media

> △ **CAUTION:** Do not initiate standby or hibernation while using drive media. Doing so may result in possible video and audio degradation and loss of audio or video playback functionality.

Standby and hibernation interfere with the use of infrared and Bluetooth® communication, and drive media. Note the following guidelines:

■ If the notebook is in standby or hibernation, you cannot initiate an infrared or Bluetooth transmission.

■ If standby or hibernation is accidentally initiated while a drive medium (such as a CD or DVD) is in use:

❏ Your playback may be interrupted.

❏ You may see the following warning message: "Putting the computer into hibernation or standby may stop the playback. Do you want to continue?" Select **No.**

❏ You may need to restart the playback to resume audio and video.

Standby, Hibernation and Shutdown Procedures

This section explains the default standby, hibernation, and shutdown procedures. For information about changing the function of some of the power features, on your notebook, see the "Power Preferences" section later in this chapter.

The controls and lights discussed in this section are illustrated in the "Power Control and Light Locations" section earlier in this chapter.

Turning the Notebook or Display On or Off

Task	Procedure	Result
Turn on the notebook.	Press the power button.	■ The power/standby lights are turned on. ■ The operating system loads.
Shut down the notebook.*	Save your work and close all open applications. Then either ■ Press the power button and follow the on-screen directions (if displayed) for shutting down the notebook. – or – ■ Shut down the notebook through the operating system. ❒ In Windows XP Home, select **Start > Turn Off Computer > Turn Off.** ❒ In Windows XP Professional, select **Start > Turn Off Computer > Shutdown > OK.**†	■ The power/standby lights are turned off. ■ The operating system shuts down. ■ The notebook is turned off.
Turn off the display while the power is on.	Close the notebook.	Closing the notebook activates the display switch, which puts the system in standby.

*If the system is unresponsive and you are unable to shut down the notebook with these procedures, refer to the "Using Emergency Shutdown Procedures" section later in this chapter.

†Depending on your network connections, the **Turn Off Computer** button might be called **Shut Down** button.

Initiating or Resuming from Standby

Task	Procedure	Result
Initiate standby.	■ With the notebook on, press **fn+f3.** ❒ In Windows XP Home, select **Start > Turn Off Computer > Standby.** ❒ In Windows XP Professional, select **Start > Turn Off Computer > Stand by > OK.** (If Stand by is not displayed, press the down arrow, and then select **Stand by** from the drop-down list.)* ■ Close the notebook lid.	■ The power/standby lights blink. ■ The screen clears.
Allow the system to initiate standby.	No action required. ■ If the notebook is running on battery power, the system initiates standby after 10 minutes of notebook inactivity. (Default setting) ■ If the notebook is attached to external power, the system does not initiate standby. ■ Power settings and timeouts can be changed in the Power Options window.	■ The power/standby lights blink. ■ The screen clears.
Resume from user-initiated or system-initiated standby.	■ Press the power button. ■ If the display was closed while the notebook was in standby, open the display.	■ The power/standby lights are turned on. ■ Your work returns to the screen.

*Depending on your network connections, the **Turn Off Computer** button might be called the **Shut Down** button.

Initiating or Restoring from Hibernation

Hibernation cannot be initiated unless it is enabled. Hibernation is enabled by default.

To verify that hibernation remains enabled:

» Select **Start > Control Panel > Performance and Maintenance > Power Options > Hibernate** tab. If hibernation is enabled, the Enable Hibernation check box is selected.

Task	Procedure	Result
Initiate hibernation.	■ In Windows XP Home, select **Start > Turn Off Computer.** Then, hold down **shift** as you select **Hibernate.** ■ In Windows XP Professional, select **Start > Turn Off Computer > Hibernate.** (If hibernate is not displayed, press the down arrow, and then select **Hibernate** from the drop-down list.)*	■ The power/standby lights are turned off. ■ The screen clears.

(Continued)

Task	Procedure	Result
Allow the system to initiate hibernation (with hibernation enabled).	No action required. If the notebook is running on battery power, the system initiates hibernation ■ After 30 minutes of notebook inactivity. ■ When the battery pack(s) reach a critical low-battery condition. Power settings and timeouts can be changed in the Power Options window.	■ The power/standby lights are turned off. ■ The screen clears.
Restore from user-initiated or system-initiated hibernation.	Press the power button.†	■ The power/standby lights are turned on. ■ Your work returns to the screen.

*Depending on your network connections, the **Turn Off Computer** button might be called the **Shut Down** button.

†If the system initiated hibernation because of a critical low-battery condition, connect external power or insert a charged battery pack before you press the power button. (The system might not respond if the drained battery pack is the only power source.)

Using Emergency Shutdown Procedures

△ **CAUTION:** Emergency shutdown procedures result in the loss of unsaved data.

If the notebook is unresponsive and you are unable to use normal Windows shutdown procedures, try the following emergency procedures in the sequence provided:

■ Press **ctrl+alt+delete.** Select **Shut Down.**

■ Press and hold the power button for at least 5 seconds.

■ Disconnect the notebook from external power and remove the battery pack. For more information about removing and storing the battery pack, refer to the "Storing a Battery Pack" section in this chapter.

Power Preferences

Many default power settings can be changed in the Power Options window. For example, you can set an audio alert to warn you when the battery pack reaches a low-power condition, or you can change the default settings for the power button.

By default, when the notebook is on:

■ Pressing the **fn+f3** hotkey, called the "sleep button" in the operating system, initiates standby.

■ The display switch turns off the display and puts the notebook in standby. The display switch is activated by closing the display. (By default and when using custom settings, the display switch setting is standby mode.)

Accessing the Power Options Window

To access the Power Options window:

■ Right-click the **Power Meter** icon in the notification area (at the far right of the taskbar), and then select **Adjust Power Properties.**

– or –

■ Select **Start > Control Panel > Performance and Maintenance > Power Options.**

Displaying the Power Meter Icon

By default, the Power Meter icon appears in your notification area, at the far right of the taskbar. The icon changes shape to indicate whether the notebook is running on a battery pack or external power. Double-click the icon to display the Power Options window.

To hide or show the Power Meter icon in the notification area:

1. Access the Power Options window.

2. Select the **Advanced** tab.

3. Select or clear the **Always show** icon on the taskbar check box.

4. Select **Apply.**

5. Select **OK.**

✎ If you cannot see an icon you have placed in the notification area (at the far right of the taskbar), the icon may be hidden. Select the arrow or vertical bar in the notification area and expand it to view hidden icons.

Setting or Changing a Power Scheme

The Power Schemes tab in the Power Options window assigns power levels to system components. You can assign different schemes depending on whether the notebook is running on a battery pack or external power.

You can also set a power scheme that initiates standby or turns off the display or hard drive after a time interval that you specify.

To set a power scheme:

1. Access the Power Options window.

2. Select the **Power Schemes** tab.

3. Select the power scheme you wish to modify, and adjust options in the lists on the screen.

4. Select **Apply.**

Using a Security Password

You can add a security feature that prompts you for a password when the notebook is turned on, resumes from standby, or restores from hibernation.

To set a password prompt:

1. Access the Power Options window.

2. Select the **Advanced** tab.

3. Select the check box for Prompt for password when the notebook resumes from standby.

4. Select **Apply.**

For more information about using security passwords, refer to Chapter 7, "Security."

Processor Performance Controls

On select notebook models, Windows XP supports software that enables you to control processor performance. The central processing unit (CPU) speed can be set for optimal performance or for optimal power conservation.

For example, the software can be set to trigger an automatic change in processor speed when the power source changes from external power to battery pack power, or when the notebook use changes between active and idle.

Processor performance controls are managed in the Power Options window.

To access Windows XP processor performance controls:

» Select **Start > Control Panel > Performance and Maintenance > Power Options > Power Schemes** tab.

The power scheme you select determines how the processor performs when the notebook is connected to external power or is running on battery power. Each power scheme for external power or battery power sets a specific processor state.

Different states may be used, depending on whether the notebook is running on external or battery power. After a power scheme has been set, no other intervention is required to control the performance of your notebook processor. The following table describes the processor performance on external and battery power for the available power schemes.

Power Scheme	Processor Performance While on External Power	Processor Performance While on Battery Power
Home/Office Desk	Always runs at the highest performance state.	Performance state is determined based on CPU demand.
Portable/Laptop	Performance state is determined based on CPU demand.	Performance state is determined based on CPU demand.
Presentation	Performance state is determined based on CPU demand.	CPU performance is lower on battery power, then steadily decreases as the battery discharges.
Always On	Always runs at the highest performance state.	Always runs at the highest performance state.
Minimal Power Management	Performance state is determined based on CPU demand.	Performance state is determined based on CPU demand.
Max Battery	Performance state is determined based on CPU demand.	Starts at lowest performance state, and then uses linear performance reduction (stop-clock throttling) as the battery discharges.

Using Battery Packs

When the notebook is connected to external AC power, the notebook runs on AC power. When a charged battery pack is in the notebook and the notebook is not connected to external power, the notebook runs on battery power.

The notebook switches between AC power and battery power according to the availability of an external AC power source. For example, if the notebook contains a charged battery pack and is running on external AC power supplied through the AC adapter, the notebook switches to battery power if the AC adapter is disconnected from the notebook.

You can leave a battery pack in the notebook or in storage, depending on how you work. Keeping a battery pack in the notebook enables the battery pack to charge whenever the notebook is connected to external AC power and also protects your work in case of a power outage.

On the other hand, battery packs in the notebook slowly discharge when the notebook is turned off. For this reason, the primary battery pack is not shipped inside the notebook and must be inserted before the notebook can run on battery power.

Identifying Battery Packs

This notebook supports up to 2 battery packs:

■ The primary battery pack is a 6-cell lithium-ion battery pack that can be used only in the battery bay. One primary battery pack is included with the notebook.

■ The optional travel battery pack is an 8-cell lithium-ion battery pack that can be attached to the bottom of the notebook.

If the notebook will be unused and disconnected from external power for more than 2 weeks, remove the battery pack and store it as described in the "Storing a Battery Pack" section in this chapter to prolong the battery pack life. For more information about leaving your work, refer to the "Initiating Standby, Hibernation or Shutdown" section in this chapter.

✎ Only AC adapters and battery packs compatible with your HP notebook should be used with the notebook. For additional information, visit the HP Web site at http://www.hp.com or call Customer Care.

Inserting or Removing a Primary Battery Pack

Ⓒ **CAUTION:** To prevent loss of work when removing a battery pack that is the sole power source, initiate hibernation or turn off the notebook before removing the battery pack.

To insert a primary battery pack:

1. Turn the notebook upside down.

2. Slide the battery pack ❶ into the battery bay until it is seated. (The battery locking latch ❷ automatically locks the battery into place.)
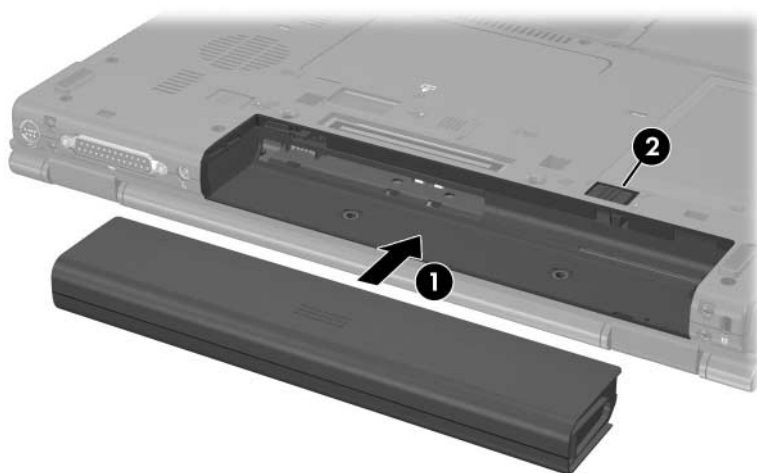
To remove a primary battery pack:

1. Turn the notebook upside down with the battery bay facing you.

2. Slide the battery locking latch ❶ to the right.

3. Slide and hold the battery release latch ❷ to the right.

4. Slide the battery pack ❸ out of the notebook.
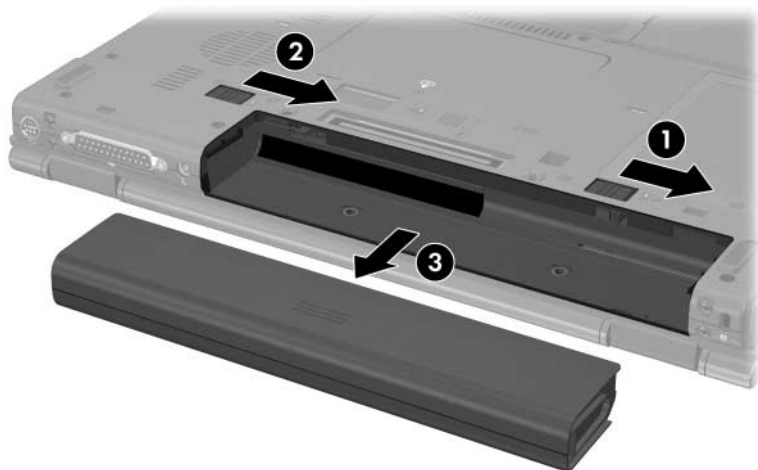
Charging Battery Packs

Multiple battery packs in the system charge and discharge in a preset sequence:

■ Charge sequence:

   1. Primary battery in the notebook battery bay

   2. Optional travel battery

■ Discharge sequence:

   1. Optional travel battery

   2. Primary battery in the notebook battery bay

While a battery pack in the notebook is being quick charged, the battery light is green. While a battery pack in the notebook is being charged, the battery light is amber. The light is turned off when all battery packs are fully charged.

✎ Battery packs can also be charged in the optional Universal Charger.

Charging the Primary Battery

The primary battery pack charges when it is inserted into the notebook and the notebook is connected to external power. External power can be supplied through the following:

■ AC adapter

■ Optional docking device (select models only)

■ Optional automobile or aircraft adapter

✎ For operating instructions, refer to the documentation included with the optional AC adapter.

Charging an Optional Travel Battery

The battery pack in the optional travel battery charges when it is attached to the notebook and the notebook is connected to external power. External power can be supplied through the following:

- AC Adapter
- Optional docking device (select models only)
- Optional automobile or aircraft adapter

Charging a New Battery Pack

Fully charge the battery pack while the notebook is connected to external power through the AC adapter.

Charging an In-Use Battery Pack

To prolong battery life and increase the accuracy of battery charge indicators:

- Allow a battery pack to discharge to 10 percent of a full charge through normal use before charging it.
- When you charge a battery pack, charge it fully.

Monitoring the Charge of a Battery Pack

This section explains several ways you can determine the amount of charge in your battery pack.

Obtaining Accurate Charge Information

To increase the accuracy of all battery charge displays:

■ Allow a battery pack to discharge to about 10 percent of a full charge through normal use before charging it.

■ When you charge a battery pack, charge it fully.

■ If a battery pack has been unused for 1 month or more, calibrate the battery pack instead of simply charging it. For calibration instructions, refer to the "Calibrating a Battery Pack" section in this chapter.

Displaying Charge Information on the Screen

This section explains how to access and interpret battery charge displays.

Viewing Charge Displays

To view information about the status of any battery pack in the notebook:

■ Select the **Power Meter** icon in the notification area (at the far right of the taskbar).

– or –

■ Select **Start > Control Panel > Performance and Maintenance > Power Options > Power Meter** tab.

Interpreting Charge Displays

Most charge displays report battery status as both a percentage and the number of minutes of charge remaining.

■ The percent indicates the approximate amount of charge remaining in the battery pack.

■ The time indicates the approximate running time remaining on the battery pack *if the battery pack continues to provide power at the current level.* For example, the time remaining will decrease when you start playing a DVD and will increase when you stop playing a DVD.

Most charge displays identify battery packs by location:

■ Location 1 is the battery pack in the primary battery bay.

■ Location 2 is the optional travel battery pack.

On some displays, a lightning bolt icon may be displayed on the charge display beside a battery pack location. The icon indicates that the battery pack in that location is charging.

Managing Low-Battery Conditions

Some low-battery condition alerts and system responses can be changed in the Power Options window of the operating system. The information in this section describes the alerts and system responses set at the factory. Preferences set in the Power Options window do not affect lights.

Identifying Low-Battery Conditions

This section explains how to identify low and critical low-battery conditions.

Low-Battery Condition

When a battery pack that is the only power source for the notebook reaches a low-battery condition, the battery light blinks in an amber color.

Critical Low-Battery Condition

If a low-battery condition is not resolved, the notebook enters a critical low-battery condition, and the amber-colored battery light blinks more rapidly

In a critical low-battery condition:

■ If hibernation is enabled and the notebook is on or in standby, the notebook initiates hibernation.

■ If hibernation is disabled and the notebook is on or in standby, the notebook remains briefly in standby, and then shuts down and loses your unsaved work.

To verify that hibernation is enabled:

1. Select **Start > Control Panel > Performance and Maintenance > Power Options > Hibernate** tab.

2. Make sure that the Enable hibernate support check box is selected.

Resolving Low-Battery Conditions

△ **CAUTION:** If the notebook has reached a critical low-battery condition and has initiated hibernation, do not restore power until the power/standby lights are turned off.

When External Power Is Available

To resolve a low-battery condition when external power is available, do one of the following:

■ Connect the AC adapter.

■ Connect an optional automobile or aircraft adapter.

When a Charged Battery Pack Is Available

To resolve a low-battery condition when a charged battery pack is available:

1. Turn off the notebook or initiate hibernation.

2. Insert a charged battery pack.

3. Turn on the notebook.

When No Power Source Is Available

To resolve a low-battery condition when no power source is available:

■ Initiate hibernation

– or –

■ Save your work and shut down the notebook.

When the Notebook Cannot Exit Hibernation

To resolve a low-battery condition when the notebook lacks the power to exit hibernation:

1. Insert a charged battery pack or connect external power.

2. Exit hibernation by pressing the power button.

Calibrating a Battery Pack

This section describes when and how to calibrate a battery pack.

When to Calibrate

Even if a battery pack is heavily used, it should not be necessary to calibrate it more than once a month. It is not necessary to calibrate a new battery pack before first use. Calibrate the battery pack under the following conditions:

■ When battery charge displays seem inaccurate.

■ When you observe a significant change in battery run time.

■ When the battery pack has been unused for one month or more.

How to Calibrate

To calibrate a battery pack, you must fully charge, fully discharge, and then fully recharge the battery pack.

Charging the Battery Pack

A battery pack can charge whether the notebook is off or in use, but it will charge faster when the notebook is off.

To charge the battery pack:

1. Insert the battery pack into the notebook.

2. Connect the notebook to an AC outlet or an optional automobile or aircraft adapter. (The battery light on the notebook is turned on.)

3. Leave the notebook connected to external power until the battery pack is fully charged. (The battery light on the notebook is turned off.)

Discharging the Battery Pack

Before you begin a full discharge, disable hibernation.

To disable hibernation:

1. Select **Start > Control Panel > Performance and Maintenance > Power Options > Hibernate** tab.

2. Clear the **Enable Hibernation** check box.

3. Select **Apply.**

The notebook must remain on while the battery pack is being discharged. The battery pack can discharge whether or not you are using the notebook but will discharge faster while the notebook is in use.

■ If you plan to leave the notebook unattended during the discharge, save your work before beginning the discharge procedure.

■ If you use the notebook occasionally during the discharge procedure and have set energy-saving timeouts, expect the following performance from your system during the discharge process:

❏ The monitor will not turn off automatically.

❏ Hard drive speed will not decrease automatically while the notebook is idle.

❏ System-initiated standby will not occur.

To fully discharge a battery pack:

1. Right-click the **Power Meter** icon in the notification area (at the far right of the taskbar), and then select **Adjust Power Properties.**

   - or -

   Access the Power Schemes tab by selecting **Start > Control Panel > Performance and Maintenance > Power Options > Power Schemes** tab.

2. Make a note of the 4 settings in the Running on batteries column so that you can reset them after the calibration.

3. Use the drop-down lists to set the 4 options to **Never.**

4. Select **OK.**

5. Disconnect the notebook from the external power source, but do *not* turn off the notebook.

6. Run the notebook on battery power until the battery pack is fully discharged. The battery light begins to blink in an amber color when the battery pack has discharged to a low-battery condition. When the battery pack is fully discharged, the battery light is turned off and the notebook shuts down.

Recharging the Battery Pack

To recharge the battery pack:

1. Connect the notebook to external power and maintain the connection until the battery pack is fully recharged. The battery light on the notebook is turned off.

   You can use the notebook while the battery pack is recharging but the battery pack will charge faster if the notebook is off.

2. If the notebook is off, turn it on when the battery pack is fully charged and the battery light is turned off.

3. Access the Power Schemes tab by selecting **Start > Control Panel > Performance and Maintenance > Power Options > Power Schemes** tab.

4. Refer to the settings you recorded earlier. Reenter the settings that you recorded for the items in the Plugged In column and the Running on Batteries column.

5. Select **OK.**

△ **CAUTION:** After calibrating the battery pack, reenable hibernation. Failure to reenable hibernation may result in a complete battery drain and potential data loss.

To reenable hibernation, select **Start > Settings > Control Panel > Performance and Maintenance > Power Options > Hibernate** tab. Select the **Enable Hibernation** check box, and then select **Apply.**

Conserving Battery Power

Using the battery conservation procedures and settings described in this section extends the time that a battery pack can run the notebook from a single charge.

Conserving Power As You Work

To conserve power as you use the notebook:

■ Turn off wireless and local area network (LAN) connections and exit modem applications when you are not using them.

■ Disconnect external devices you are not using that are not connected to an external power source.

■ Stop or remove a PC Card you are not using. For more information, refer to Chapter 5, "Hardware Components."

■ Remove a CD or DVD that you are not using.

■ Use the **fn+f9** and **fn+f10** hotkeys to adjust screen brightness as you need it.

■ Use optional powered speakers instead of the internal speakers, or use the volume buttons to adjust system volume as you need it.

■ Turn off a device connected to the S-Video-out jack (select models) by using the **fn+f4** hotkey or by turning off support for the device in Windows.

■ Run the notebook on external power while formatting a diskette.

■ If you leave your work, initiate standby or hibernation, or shut down the notebook.

Selecting Power Conservation Settings

To set the notebook to conserve power:

■ Select a short wait for the screen saver and select a screen saver with minimal graphics and motion.

To access screen saver settings:

Select **Start > Control Panel > Appearance and Themes > Display > Screen Saver** tab.

■ Select a Power Scheme with low-power-use settings through the operating system. Refer to the "Setting or Changing a Power Scheme" section in this chapter.

Storing a Battery Pack

△ **CAUTION:** To prevent damage to a battery pack, do not expose it to high temperatures for extended periods of time.

If a notebook will be unused and disconnected from external power for more than 2 weeks, remove any battery packs and store them separately.

High temperatures accelerate the self-discharge rate of a stored battery pack. To prolong the charge of a stored battery pack, place it in a cool, dry place.

Use the following table to estimate how long you can safely store a battery pack. The storage times provided are based on a battery pack that contains 50 percent of a full charge. A fully charged battery pack can be safely stored for longer times; a battery pack containing a lower charge can be safely stored for less time.

Calibrate a battery pack before using it if it has been stored for one month or more.

Temperature Range °F	Temperature Range °C	Safe Storage Time
115° to 140°	46° to 60°	Less than 1 month
79° to 113°	26° to 45°	No more than 3 months
32° to 77°	0° to 25°	1 year

Disposing of a Used Battery Pack

⚠ **WARNING:** To reduce the risk of fire or burns, do not disassemble, crush, or puncture a battery pack; short the external contacts on a battery pack; or dispose of a battery pack in fire or water. Do not expose a battery pack to high temperatures above 60°C (140°F). Replace only with the HP battery pack approved for this computer.

When a battery pack has reached the end of its useful life, do not dispose of the battery pack in general household waste. Follow the local laws and regulations in your area for computer battery pack disposal.

In Europe, dispose of or recycle the battery packs by using the public collection system or by returning them to HP, your authorized service partner, or their agents.

3

TouchPad and Keyboard

TouchPad

The following illustration and table identify and describe the notebook TouchPad.
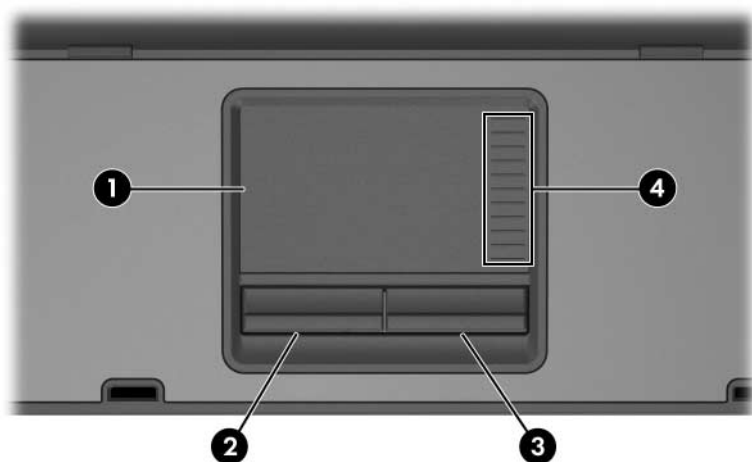
Component		Description
❶	TouchPad*	Moves the pointer and selects or activates items on the screen. Can be set to perform other mouse functions, such as scrolling, selecting, and double-clicking.

(Continued)

Component		Description
❷	Left TouchPad button*	Functions like the left button on an external mouse.
❸	Right TouchPad button*	Functions like the right button on an external mouse.
❹	TouchPad scroll zone*	Scrolls upward or downward.

*This table describes default settings. For information about changing the functions of TouchPad features, see the "Setting TouchPad Preferences" section in this chapter.

Using the TouchPad

To move the pointer, slide your finger across the TouchPad surface in the direction you want the pointer to go. Use the left and right TouchPad buttons as you would the left and right buttons on an external mouse. To scroll up and down using the TouchPad vertical scroll area, slide your finger up or down over the raised area.

Using an External Mouse

An external USB mouse can be connected to the notebook using one of the ports on the right or left side of the notebook. An external serial mouse can be connected to the serial port on the right side of the notebook (select models only). An external PS/2 or USB mouse can be connected to the system using the connectors on an optional docking device (select models only).

Setting TouchPad Preferences

Mouse Properties in Windows enables you to customize settings for pointing devices, including:

■ TouchPad tapping, which enables you to tap the TouchPad once to select an object or twice to double-click an object (enabled by default).

■ Edge motion, which enables you to continue to scroll even though your finger has reached the edge of the TouchPad (disabled by default).

Other features, such as mouse speed preferences and mouse trails, are also found in the Mouse Properties window.

To access Mouse Properties:

» Select **Start > Control Panel > Printers and Other Hardware > Mouse** icon.

Using Hotkeys

Hotkeys are preset combinations of the **fn** key ❶ and either the **esc** key ❷ or one of the function keys ❸.

The icons on the **f3, f4,** and **f8** through **f10** keys represent the hotkey functions. Hotkey functions and procedures are discussed in the following sections.

✎ Your notebook may look slightly different from the illustration in this section.

	Component	Description
❶	**fn** key	Executes frequently used system functions when pressed in combination with a function key or the **esc** key.
❷	**esc** key	Executes frequently used system functions when pressed in combination with the **fn** key.
❸	Function keys	Execute frequently used system functions when pressed in combination with the **fn** key.

Hotkey and Shortcut Key Quick Reference

Function	Key Combination to Activate Function	Key Combination to Deactivate Function
Initiate standby	**fn+f3**	Power button
Switch between notebook display and external display	**fn+f4**	**fn+f4**
View battery information	**fn+f8**	**fn+f8**
Decrease screen brightness	**fn+f9**	**fn+f9**
Increase screen brightness	**fn+f10**	**fn+f10**
Display system information	**fn+esc**	**fn+esc**

Initiating Standby (fn+f3)

When the notebook is on, press the **fn+f3** hotkey to initiate standby. When standby is initiated, your work is saved in random access memory (RAM), the screen is cleared, and power is conserved. While the notebook is in standby, the power/standby lights blink.

To exit standby:

» Press the power button.

The **fn+f3** hotkey is set at the factory to initiate standby. The function of the **fn+f3** hotkey, called the "sleep button" in Windows, can be changed. For example, the **fn+f3** hotkey can be set to initiate hibernation instead of standby. For more information about standby, hibernation, and changing the function of the **fn+f3** hotkey, refer to Chapter 2, "Power."

Switching Displays (fn+f4)

The **fn+f4** hotkey switches the image among display devices connected to the external monitor connector or the S-Video-out jack (select models) on the notebook. For example, if an external monitor is connected to the notebook, pressing the **fn+f4** hotkey multiple times toggles the image between the notebook display, the external monitor display, and a simultaneous display on both the notebook and the monitor.

Most external monitors receive video information from the notebook using the external VGA video standard. The **fn+f4** hotkey can also toggle images among other devices receiving video information from the notebook.

The following 4 video transmission types, with examples of devices that use them, are supported by the **fn+f4** hotkey:

■ LCD (notebook display)

■ External VGA (most external monitors)

■ S-Video (televisions, camcorders, VCRs, and video capture boards with S-Video-in jacks, on select models)

■ Composite video (televisions, camcorders, VCRs, and video capture boards with composite-video–in jacks)

Viewing Battery Charge Information (fn+f8)

Press **fn+f8** to display charge information for all installed battery packs. The display indicates which battery packs are charging and reports the amount of charge remaining in each battery pack.

Battery pack locations are indicated by number:

■ Location 1 is the primary battery pack.

■ Location 2 is the optional travel battery pack.

Decreasing Screen Brightness (fn+f9)

Press **fn+f9** to decrease screen brightness. Hold down the hotkey to change the brightness level incrementally.

Increasing Screen Brightness (fn+f10)

Press **fn+f10** to increase screen brightness. Hold down the hotkey to change the brightness level incrementally.

Displaying System Information (fn+esc)

Press **fn+esc** to display information about system hardware components and software version numbers. Press **fn+esc** a second time to remove the system information from the screen.

✎ The system BIOS date is the version number of the system ROM. The BIOS date may display in a decimal format, such as 10/19/2002 F.07.

Using Hotkeys with External Keyboards

The following table describes how certain hotkeys are used on external keyboards:

Notebook Keys	External Keyboard Keys
fn+esc	scroll lock+scroll lock+esc*
fn+f4	scroll lock+scroll lock+f4
fn+f8	scroll lock+scroll lock+f8*

*Pressing the **scroll lock** 2 times on an external keyboard is a substitute for the **fn** key on the notebook keyboard.

Using Quick Launch Buttons (Select Models Only)

Use the Quick Launch buttons to open frequently used applications.
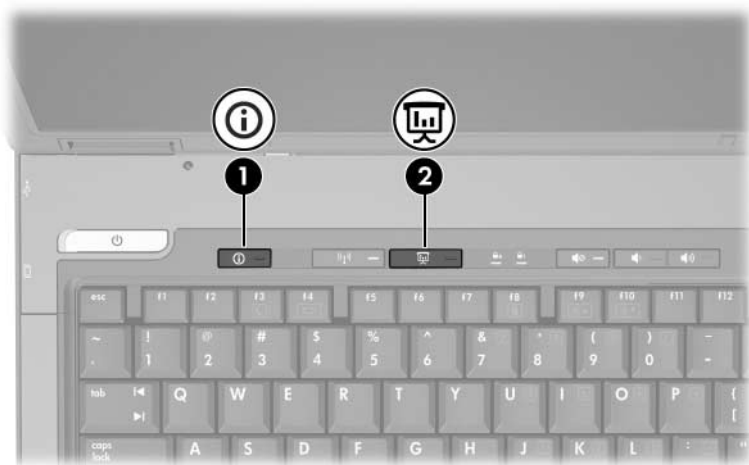
Component	Description
❶ Info Center button	Launches Info Center. Refer to "Using Info Center (Select Models Only)" in Chapter 4, "Multimedia" for more information.
❷ Presentation mode button	Starts Presentation mode, which opens an application, folder, file, or Web site, and simultaneously displays on the notebook screen and an external device connected to the external monitor port or S-Video-out jack on the rear panel or to ports and jacks on an optional docking device.

Keypads

The notebook has an embedded numeric keypad and also supports an optional external keypad or an optional external keyboard that includes a numeric keypad.

✎ Your notebook may look slightly different from the illustration in this section.
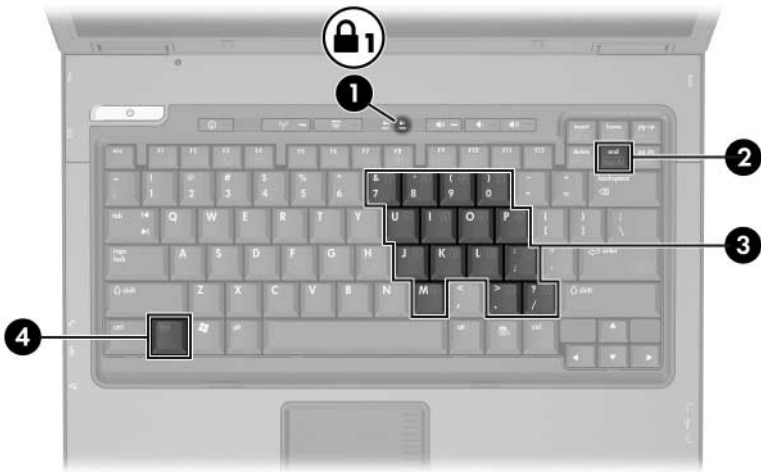
Component	Description
❶	num lock light
❷	**num lk** key
❸	Embedded numeric keypad
❹	**fn** key

Using the Internal Keypad

The 15 keys of the embedded numeric keypad can be used like the keys on an external keypad. When the embedded numeric keypad is turned on, each key on the keypad performs the function indicated by the icon in the upper-right corner of the key.

Enabling and Disabling the Embedded Numeric Keypad

Press **fn+num lk** to enable the embedded numeric keypad. The num lock light is turned on. Press **fn+num lk** again to return the keys to their standard keyboard functions.

✎ The embedded numeric keypad does not work while an external keyboard or keypad is connected to the notebook or to an optional docking device (select models only).

Switching Key Functions on the Embedded Numeric Keypad

You can temporarily switch the functions of keys on the embedded numeric keypad between their standard keyboard functions and their keypad functions by using the **fn** key or the **fn+shift** key combination.

■ To change the function of a keypad key to keypad functions while the keypad is off, press and hold the **fn** key while pressing the keypad key.

■ To use the keypad keys temporarily as standard keys while the keypad is on:

❏ Press and hold the **fn** key to type in lowercase.

❏ Press and hold **fn+shift** to type in uppercase.

Using an External Keypad

Most keys on most external keypads function differently according to whether num lock mode is on or off. (By default num lock mode is off.) For example:

■ When num lock is on, most keypad keys type numbers.

■ When num lock is off, most keypad keys function like the arrow, page up, or page down keys.

When num lock on an external keypad is turned on, the num lock light on the notebook is turned on. When num lock on an external keypad is turned off, the num lock light on the notebook is turned off.

If the external keypad is connected, the embedded numeric keypad cannot be turned on.

Enabling or Disabling Num Lock Mode As You Work

To turn num lock on or off on an external keypad as you work:

» Press the **num lk** key on the external keypad, not on the notebook.

4

Multimedia

Using Audio Features

The following figure and table describe the audio features of the notebook.

✎ Components included with your notebook may vary by geographical region and by model. The illustrations in this chapter identify the standard features included in most notebook models. Refer to the illustration that most closely matches your notebook.

	Component	Description
❶	Volume mute button	Turns off notebook sound.
❷	Volume mute light	On: Notebook sound is turned off.
❸	Volume down button	Decreases notebook sound.
❹	Volume up button	Increases notebook sound.
❺	Audio-in (microphone) jack	Connects an optional stereo or monaural microphone.
❻	Audio-out (headphone) jack	Produces notebook sound when connected to optional powered stereo speakers, headphones, headset, or television audio.
❼	Speakers (2)	Produce notebook sound.

Component		Description
❶	Speaker	Produces notebook sound.
❷	Audio-out (headphone) jack	Produces notebook sound when connected to optional powered stereo speakers, headphones, headset, or television audio.
❸	Audio-in (microphone) jack	Connects an optional stereo or monaural microphone.

Using the Audio-In (Microphone) Jack

Your notebook is equipped with a stereo microphone jack that supports a stereo array and monaural microphone. Using sound recording application software with an external, stereo microphone allows for stereo (dual channel) recordings and stereo playbacks.

When connecting a microphone to the microphone jack, use a microphone with a 3.5-mm plug.

Using the Audio-Out (Headphone) Jack

⚠ **WARNING:** To reduce the risk of personal injury, adjust the volume before putting on headphones or a headset.

The headphone jack is also used to connect the audio function of an audio/video device such as a television or VCR.

When connecting a device to the headphone jack:

■ Use only a 3.5-mm stereo plug.

■ For best sound quality, use 24-ohm to 32-ohm headphones.

✎ When a device is connected to the headphone jack, the internal speakers are disabled.

Adjusting the Volume

You can adjust the volume using any of the following controls:

■ Notebook volume buttons (select models only)

❏ To mute or restore volume, press the volume mute button.

❏ To decrease the volume, press the volume down button.

❏ To increase the volume, press the volume up button.

■ Windows volume control:

1. Click the **Volume** icon in the notification area (at the far right of the taskbar).

2. Increase or decrease the volume by moving the slider up or down. (You can also click the check box next to **Mute** to mute the volume.)

– or –

1. Double-click the **Volume** icon.

2. In the Volume Control column, increase or decrease the volume by moving the Volume slider up or down. You can also adjust the balance or mute the volume.

✎ Volume can also be adjusted within some applications.

If the Volume icon is not in the notification area, follow the steps below to place it in the notification area.

1. Select **Start > Control Panel > Sounds, Speech, and Audio Devices > Sounds and Audio Devices.**

2. Select the **Volume** tab.

3. Select the check box for **Place volume icon in the taskbar.**

4. Select **Apply.**

Using Video Features (Select Models Only)

The notebook features a 7-pin S-Video-out jack that connects the notebook to an optional S-Video device such as a television, VCR, camcorder, overhead projector, or video capture card.

The notebook can support one S-Video device connected to the S-Video-out jack while simultaneously supporting an image on the notebook display and on any other supported external display. The S-Video connection usually provides a higher quality image than a composite-video connection.

To transmit video signals through the S-Video-out jack, you need an S-Video cable, available from most electronics retailers. If you are combining audio and video functions, such as playing a movie from a DVD in an optional MultiBay drive to a television, you also need a standard audio cable, available from most electronics retailers.

Using the S-Video-out Jack

To connect a video device to the S-Video-out jack:

1. Plug either end of the S-Video cable into the S-Video-out jack on the notebook.

2. Connect the other end of the cable to the video device, as instructed in the documentation included with the device.

✎ If the S-Video-out jack on the notebook is not accessible because the notebook is docked into an optional docking device, you can connect the device to the S-Video-out jack on the docking device.

Connecting a Monitor or Projector

To connect an external monitor or projector to the notebook, insert the monitor cable into the external monitor port on the left side of the notebook.

✎ Your notebook may look slightly different from the illustration in this section.

✎ If a properly connected external monitor or projector does not display an image, try pressing the **fn+f4** hotkey to switch the image to the monitor.

Using CD and DVD Software

The following software is supported for use with the notebook:

■ Windows Media Player—Plays audio CDs and video DVDs, and copies audio and data CDs. This software is included with the Windows operating system.

■ InterVideo WinDVD—Plays video CDs and DVD movies. This software is preinstalled on select notebooks. You can also obtain this software by any of the following methods:

❏ Install WinDVD from the *Application and Driver Recovery* disc provided with most HP notebooks.

❏ If you do not have the *Application and Driver Recovery* disc, contact Customer Care for a copy of the restore solution for your notebook.

❏ Download the software from the HP Web site: http://www.hp.com

■ InterVideo WinDVD Creator Plus—Provides the ability to create, edit, and burn movies to a DVD or video CD. This software is located on the *InterVideo WinDVD Creator* CD, included with select notebooks.

■ Sonic RecordNow!—Enables you to create copies of data and audio CDs and DVDs and create personalized audio CDs and DVDs. RecordNow! is preinstalled on select notebooks.

Observing the Copyright Warning

It is a criminal offense, under applicable copyright laws, to make unauthorized copies of copyright-protected material, including computer programs, films, broadcasts, and sound recordings. This notebook should not be used for such purposes.

Installing Software

To install software from a CD included with the notebook:

1. Insert the software CD into the optical drive.

   ❏ If Autorun is enabled an installation wizard is displayed.

   ❏ If Autorun is disabled, select **Start > Run.** Then enter:

     x:\setup.exe

     (where *x* is your CD drive designation).

2. Select **OK.**

3. When the installation wizard is displayed, follow the installation instructions on the screen.

4. Restart the notebook if prompted.

✎ Repeat the installation procedure for all software you want to install.

✎ WinDVD Creator has special drive requirements for proper installation. To install WinDVD Creator, refer to the instructions provided with the *InterVideo WinDVD Creator* CD.

Enabling AutoPlay

AutoPlay is an option in Windows that turns the Autorun feature on or off. Autorun starts a program or plays a title on a disc as soon as it is inserted into the drive and the drive door is closed. By default, AutoPlay is enabled on the notebook.

To disable AutoPlay or to enable AutoPlay if the feature has been turned off, refer to your operating system documentation or visit the Microsoft Web site at http://www.microsoft.com.

Using Windows Media Player

Windows Media Player is included with the Windows operating system. It can be used to play CDs and DVDs, and create audio and data CDs. To play a CD or DVD:

1. Insert the CD or DVD into the optical drive.

2. Wait several seconds, and then:

   ❏ If AutoPlay is enabled, Windows Media Player opens.

   ❏ If Windows Media Player does not open, select **Start > (All) Programs > Accessories > Entertainment > Windows Media Player,** and then select the **Play** button to play the CD.

For additional instructions on using this application, select **Help** on the Windows Media Player menu bar.

Using WinDVD Player

InterVideo WinDVD can be used to play video CDs and DVD movies. To locate and install InterVideo WinDVD, refer to the "Installing Software" section in this chapter.

To open WinDVD when AutoPlay has been disabled:

» Select **Start > (All) Programs > InterVideo WinDVD > InterVideo WinDVD.**

For more information about using WinDVD, select **Help** on the WinDVD menu bar.

Using WinDVD Creator Plus (Select Models Only)

WinDVD Creator Plus can be used to create, edit, and burn movies to a DVD or video CD. This software must be installed from the *InterVideo WinDVD Creator* CD provided with select notebooks.

WinDVD Creator Plus must be installed using a DVD/CD-RW Combo Drive or a DVD±RW and CD-RW Combo Drive only. If you do not use a DVD/CD-RW Combo Drive or DVD±RW and CD-RW Combo Drive, WinDVD Creator Plus will not be installed.

For more information about WinDVD Creator Plus capabilities and instructions on creating DVDs and Video CDs, refer to the WinDVD Creator Plus online Help after installing the software.

Using Sonic RecordNow!

RecordNow! can be used to create backups of data or audio CDs or DVDs, transfer audio files from CDs to a hard drive, and create personalized audio CDs. RecordNow! is preinstalled on your notebook. For more information about RecordNow! capabilities and instruction on creating data and audio CDs and DVDs, refer to the Sonic RecordNow! Tutorial and online Help.

Changing DVD Region Settings

⚠ **CAUTION:** The region settings on your DVD drive can be changed only 5 times.

■ The region setting you select the fifth time becomes the permanent region setting on the DVD drive.

■ The number of allowable region changes remaining on the drive is displayed in the Remaining Times Until Permanent field in the WinDVD window. The number in the field includes the fifth and permanent change.

Most DVDs that contain copyrighted files also contain region codes. The region codes help protect copyrights internationally.

You can play a DVD containing a region code only if the region code on the DVD matches the region setting on your DVD drive.

If the region code on a DVD does not match the region setting on your drive, a Playback Of Content From This Region Is Not Permitted message is displayed when you insert the DVD. To play the DVD, you must change the region setting on your DVD drive. DVD region settings can be changed through the operating system or through some DVD players.

Changing Settings Using the Operating System

To change settings through the operating system:

1. Open Device Manager by selecting **Start > My Computer.**

2. Right-click in the window and select **Properties > Hardware** tab **> Device Manager.**

3. Select **DVD/CD-ROM drives,** right-click the DVD drive for which you want to change region settings, and then select **Properties.**

4. Make the desired changes on the **DVD Region** tab.

5. Select **OK.**

For additional information, refer to the Windows operating system Help and Support.

Changing Settings Using WinDVD

To change the region settings on a drive using WinDVD:

1. Open WinDVD through one of the following methods:

   ❏ Select the WinDVD Player icon in the notification area, at the far right of the taskbar.

   ❏ Select **Start > (All) Programs > InterVideo WinDVD > InterVideo WinDVD.**

2. Right-click the WinDVD player window.

3. Select **Setup.**

4. Select the region on the **Region** tab.

5. Select **Apply**, and then **OK.**

Changing Settings Using Other DVD Software

To change region settings on a drive using a DVD player other then WinDVD, refer to the documentation provided with the player.

Using Presentation Mode (Select Models Only)

The Presentation Mode Quick Launch button toggles Presentation mode on and off. Turning Presentation mode on opens an application, folder, file, or Web site that you specify. The image simultaneously displays on the notebook screen and on an external device connected to

■ The external monitor port or S-Video-out jack on the rear panel.

■ Ports and jacks on an optional docking device.
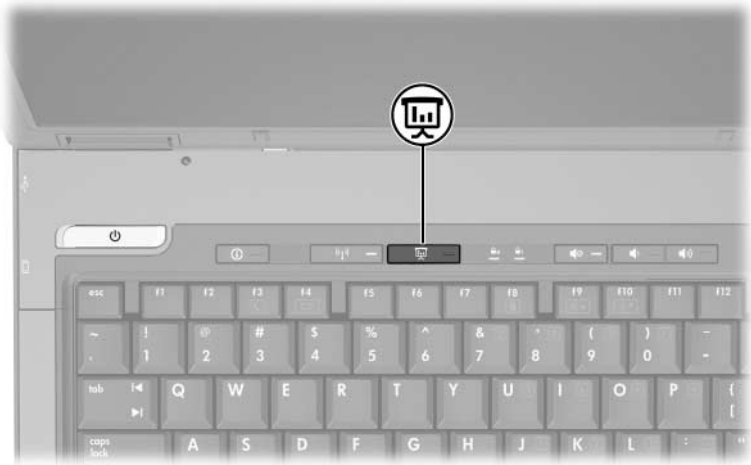
When you first click on the Presentation mode button, the Presentation Settings dialog box displays. In this dialog box, you can

■ Set the program to start when the button is pressed.

■ Choose a power scheme.

■ Choose whether or not you want to show the Presentation Settings dialog box each time you press Presentation mode button.

> ✎ If you do not select this option, each time you press the Presentation mode button, the Presentation Settings dialog box displays and you have to click **Continue** to open the program, application, folder, file, or Web site you have selected to start when the button is pressed.

■ Automatically switch to an external display.

You can modify the Presentation mode settings using the Quick Launch Button control panel. Refer to "Setting Presentation Mode Preferences (Select Models Only)" in this chapter for information on setting Presentation mode settings.

Quick Launch Buttons Control Panel

You can use the Quick Launch Buttons control panel to

■ Change Presentation mode settings (select models only).

■ Set preferences for tiling windows on the Windows desktop.

■ Set advanced preferences, including

❏ Setting preferences for the display of the Quick Launch Buttons icon.

❏ Setting button assignments for the Easy Access buttons on an optional external keyboard.

The following sections provide instructions for setting preferences within the control panel. For additional onscreen information about any item on the control panel, select the help button in the upper-right corner of the window. The help button is identified with a question mark icon.

Accessing the Quick Launch Buttons Control Panel

You can access the Quick Launch Buttons control panel from the Start button or from an icon that you can display in the notification area (at the far right of the taskbar) or on the Windows desktop.

To access the Quick Launch Buttons control panel from the Start button:

» Select **Start > Control Panel > Printers and Other Hardware > Quick Launch Buttons.**

Setting Presentation Mode Preferences (Select Models Only)

Setting the Presentation Mode Button

To set an application, folder, file, or Web site to start when the Presentation mode button is pressed:

1. Open the Quick Launch Buttons control panel:

   ❏ Select **Start > Control Panel > Printers and Other Hardware > Quick Launch Buttons.**

   - or -

   ❏ Select the Quick Launch Buttons icon in the notification area (at the far right of the taskbar) or on the Windows desktop.

2. Select the **Presentation** tab.

3. In the box under Program to Start, add the application, folder, file, or Web site you want to start when the Presentation mode button is pressed, or select **Browse** to view available applications, folders, files, or Web sites.

4. To save your preferences and close the display, select **OK.**

Changing the Power Scheme

By default the Presentation power scheme is selected when the Presentation mode button is pressed. To change the power scheme:

1. Open the Quick Launch Buttons control panel:

   ❏ Select **Start > Control Panel > Printers and Other Hardware > Quick Launch Buttons.**

   - or -

   ❏ Select the Quick Launch Buttons icon in the notification area (at the far right of the taskbar) or on the Windows desktop.

2. Select the **Presentation** tab.

3. Select an option from the drop-down list box, or select **Power Options** to open the Microsoft Power Options control panel to view or change the current power scheme.

4. To save your preferences and close the display, select **OK.**

Showing the Welcome Screen

You can choose to show the Presentation Properties dialog box each time you press the Presentation mode button. By default, this option is turned on.

To turn it off, click the check box next to Do not show this dialog box again.

Switching to an External Display

By default, the Automatically switch to external display setting in the Presentation tab is not selected. When you press the Presentation mode button, the application, folder, file, or Web site you selected in the Program to Start setting opens.

To view the selected application, folder, file, or Web site on an additional, external display:

1. Connect an external display to your notebook.

2. Select the **Automatically switch to external display** option.

3. Press the Presentation mode button. (The power scheme changes to Presentation.)

✎ You can toggle between displays by pressing the Presentation mode button. If you do this, the power scheme reverts to the original settings.

Setting Tiling Preferences

To set tiling preferences on the Windows desktop:

1. Open the Quick Launch Buttons control panel:

   ❏ Select **Start > Control Panel > Printers and Other Hardware > Quick Launch Buttons.**

   – or –

   ❏ Select the Quick Launch Buttons icon in the notification area (at the far right of the taskbar) or on the Windows desktop.

2. Select the **Quick Til**e tab.

3. Select **Vertical Tile** or **Horizontal Tile,** and then select the applications to tile in the Applications currently running box.

4. To save your preferences and close the display, select **OK.**

Setting Advanced Preferences

You can set icon and external keyboard assignments in the Quick Launch Button control panel.

Displaying the Quick Launch Buttons Icon

To show or hide the Quick Launch Buttons Properties icon in the notification area (at the far right of the taskbar) or on the Windows desktop:

1. Open the Quick Launch Buttons control panel:

   ❏ Select **Start > Control Panel > Printers and Other Hardware > Quick Launch Buttons.**

   – or –

   ❏ Select the **Quick Launch Buttons** icon in the notification area (at the far right of the taskbar) or on the Windows desktop.

2. Select the **Advanced** tab. On the Advanced tab you can

   ❏ Display or hide the Quick Launch Buttons icon in the notification area (at the far right of the taskbar) or on the Windows desktop.

   ◆ To display the icon:

      Select the **Show icon on the taskbar** or **Show icon on the deskto**p check box.

   ◆ To hide the icon:

      Clear the **Show icon on the taskbar** or **Show icon on the desktop** check box.

3. To save your preferences and close the display, select **OK.**

Setting Button Assignments on an External Keyboard

If you are using an optional HP external keyboard that feaures Easy Access buttons, you can set Easy Access button assignments and schemes on the Settings tab.

The Settings tab is disabled and hidden by default. To display and enable the Settings tab in the Quick Launch Buttons control panel:

1. Open the Quick Launch Buttons control panel:

   ❏ Select **Start > Control Panel > Printers and Other Hardware > Quick Launch Buttons.**

   – or –

   ❏ Select the **Quick Launch Buttons** icon in the notification area (at the far right of the taskbar) or on the Windows desktop.

2. Select the **Advanced** tab. Then:

   ❏ To display and enable the Settings tab, select the check box for **Allow users to modify button assignments on external keyboard.**

   ❏ To disable and hide the Settings tab, clear the check box for **Allow users to modify button assignments on external keyboard.**

   ✎ If you enable the Settings tab, you must exit out of the Quick Launch Buttons Properties dialog box, and then access it again in order to see the Settings tab.

3. To save your preferences and close the display, select **OK.**

For information about managing Easy Access button assignments and schemes, refer to your keyboard documentation.

Using Info Center (Select Models Only)

Info Center enables you to quickly open the following software solutions:

■ Altiris Local Recovery

■ Contact HP

■ Help and Support

■ Options Demo

■ ProtectTools Security Manager

■ Software Setup

■ System Information

■ Wireless Assistant

To access Info Center:

1. Press the Info Center button.

   – or –

   Select **Start > Info Center.**

2. In the Info Center window, select the software application you want to open.

For more information, refer to the Info Center online help.

5

Hardware Components

Using Drives

The following sections identify and describe the hard drive, and
explain how to use hard drives and optical disc drives.

Caring for Drives

Drives are fragile notebook components that must be handled
with care. The following cautions apply to all drives. Additional
cautions are included with the procedures to which they apply.

△ **CAUTION:** To prevent loss or damage to the notebook or a drive:

■ To reduce the risk of data loss, initiate standby before you move a computer or external hard drive from one location to another. To initiate standby, select **Start > Turn Off Computer > Standby.** For more information, refer to Chapter 2, "Power."

■ Handle a drive carefully. Do not drop it.

■ Excessive force can damage drive connectors. When you insert a drive, use only enough force to seat the drive.

■ Do not spray a drive with cleaning fluid or other liquid or expose it to temperature extremes.

■ Do not remove the hard drive (the hard drive in the hard drive bay) except for repair or replacement.

■ Electrostatic discharge can damage electronic components. To prevent electrostatic damage to the notebook or a drive:

❏ Discharge yourself from static electricity before handling a drive by touching a grounded metal object

❏ Avoid touching the connectors on a drive.

For more information about preventing electrostatic damage, refer to the *Regulatory and Safety Notices* guide on the *Notebook Documentation* CD.

■ Avoid exposing a drive or a diskette to devices with magnetic fields. Security devices with magnetic fields include airport walk-through devices and security wands. The airport security devices that check carry-on luggage, usually while it is placed on a conveyor belt, use x-rays instead of magnetism and will not damage a drive or a diskette.

■ If you mail a drive, ship it in packaging that protects it from shock, vibration, temperature, and high humidity. Label the package "FRAGILE."

Adding a Drive to the System

Removable drives enable you to store and access data.

■ A standard drive can be added to the system by inserting the drive into an optional docking device (select models only).

■ A USB drive can be added by connecting the drive to a USB port on the notebook or optional docking device (select models only).

For information about connecting a USB drive, refer to the "Connecting a USB Device" section in this chapter.

The notebook has 2 drive bays:

■ The hard drive bay supports only a hard drive.

■ The optical drive supports the following optical devices:

❏ CD-ROM drive

❏ DVD-ROM drive

❏ DVD/CD-RW Combo drive

❏ DVD±RW and CD-RW Combo Drive

Identifying the IDE Drive Light

The IDE drive light blinks when either the hard drive or optical drive is being accessed.

✎ Your notebook may look slightly different from the illustration in this section.

Replacing the Hard Drive

∆ **CAUTION:** To prevent system lockup and loss of information:

■ Shut down the notebook before removing the hard drive from the hard drive bay. Do not remove the hard drive while the notebook is on, in standby, or in hibernation.

■ If you are not sure whether the notebook is off or in hibernation, turn the notebook on by pressing the power button. Then shut down the notebook through the operating system.

Remove the hard drive only after the notebook is properly shut down.

To remove the hard drive:

1. Save your work.

2. Shut down the notebook and close the display.

3. Turn the notebook upside down with the battery facing you.

4. Loosen the 2 hard drive screws ❶.

5. Lift the hard drive cover away from the notebook ❷.
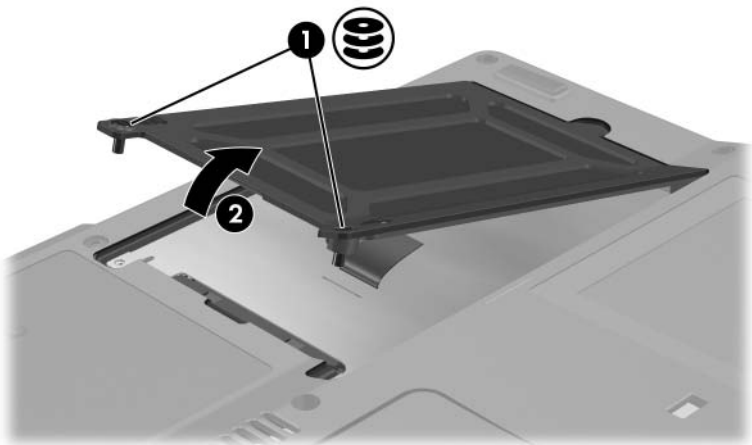
6. Loosen the hard drive screw ❶.

7. Pull the hard drive tab ❷ to the right to disconnect the hard drive.
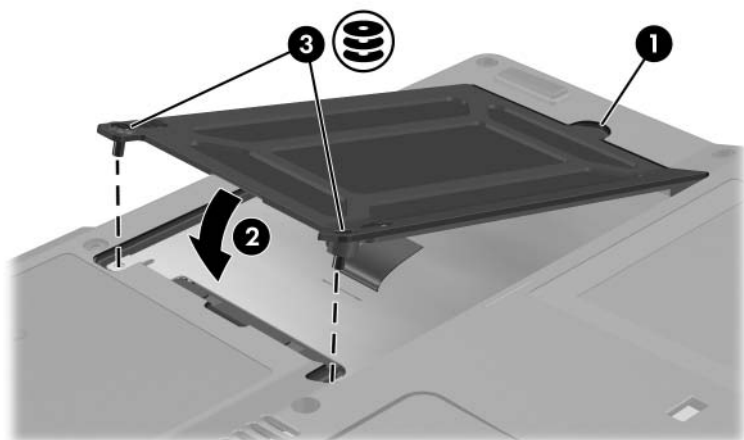
8. Lift the hard drive ❸ from the notebook.
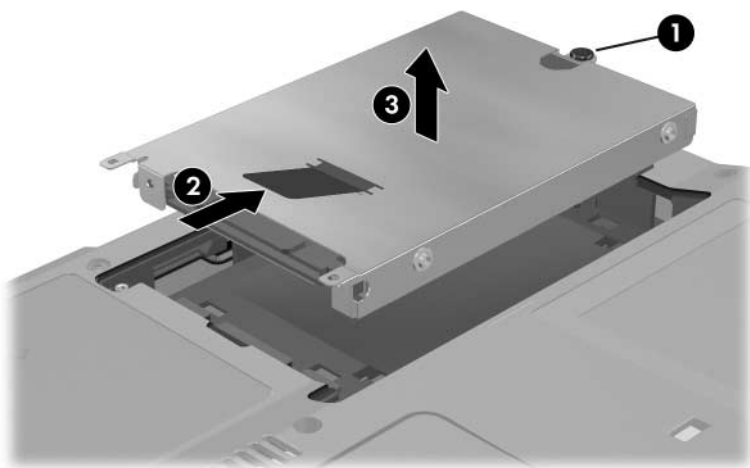
To install a hard drive:

1. Insert the hard drive into the hard drive bay on the bottom of the notebook ❶.

2. Pull the hard drive tab ❷ to the left to connect the hard drive.

3. Tighten the hard drive screw ❸.
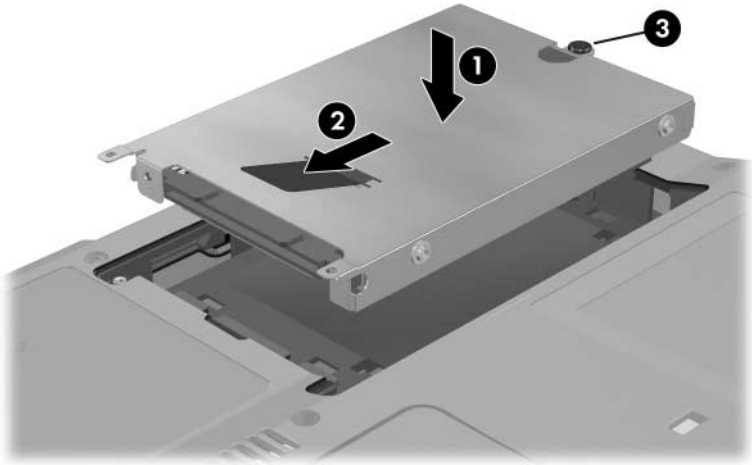
4. Align the tab ❶ on the hard drive cover on the notebook.

5. Close the cover ❷.

6. Tighten the hard drive cover screws ❸.

Inserting and Removing Optical Discs

✎ Your notebook may look slightly different from the illustrations in this section.

Inserting an Optical Disc

1. Turn on the notebook.

2. Press the release button ❶ on the drive bezel to release the media tray.

3. Pull the tray out ❷ until it is fully extended. Position a CD or one-sided DVD over the tray with the label side up.

4. Gently press the disc ❸ onto the tray spindle until the disc snaps into place. Handle the disc by the edges, not the flat surfaces. If the media tray is not fully extended, tilt the disc to position it over the tray spindle, and then press it into position.
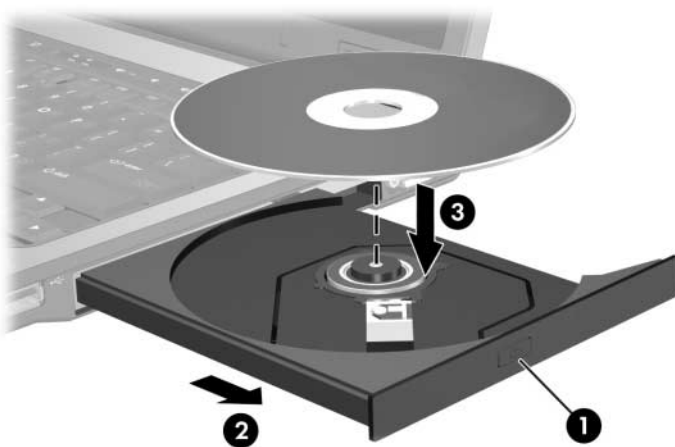
5. Close the media tray.

✎ After you insert a DVD, a short pause is normal as Autorun opens the DVD and WinDVD player.

Removing an Optical Disc (With Power)

If power is available:

1. Turn on the notebook.

2. Press the release button ❶ on the drive bezel to release the media tray, and then pull the tray ❷ out until it is fully extended.

3. Remove the disc ❸ from the tray by gently pressing down on the spindle while lifting the outer edges of the disc. Handle the disc by the edges, not the flat surfaces. If the media tray is not fully extended, tilt the disc as you remove it.
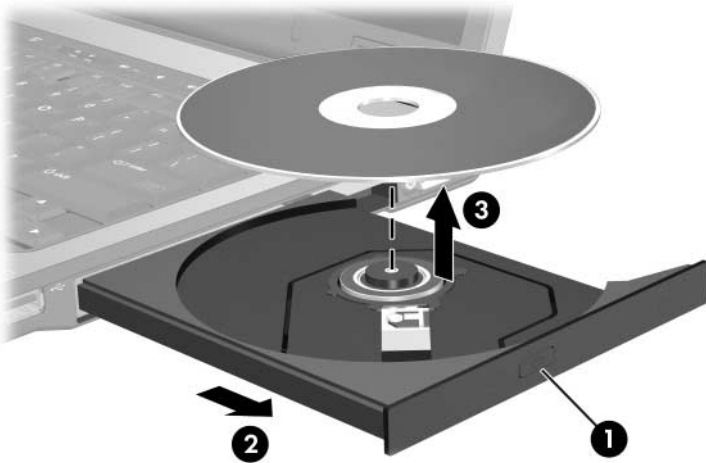
4. Close the media tray and place the disc in a protective case.

Removing an Optical Disc (Without Power)

✎ The following illustrations identify the standard external features included in most notebook models. Refer to the illustration that most closely matches your notebook model.
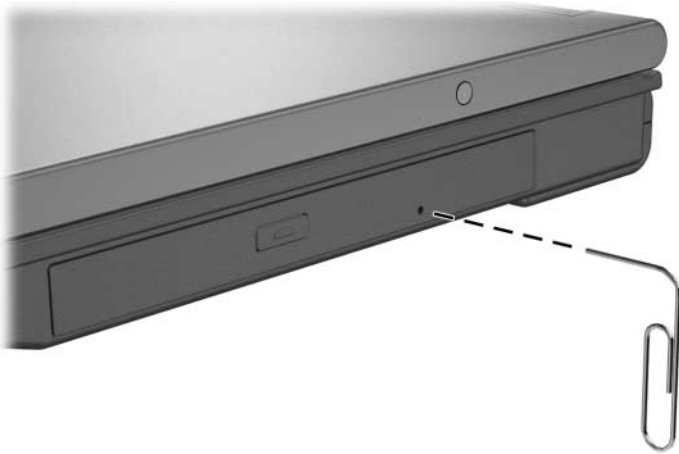
If power is unavailable:

1. Insert the end of a paper clip into the release access in the front bezel of the drive.

2. Press gently on the paper clip until the media tray is released, and then pull out the tray until it is fully extended.

3. Remove the disc from the tray by gently pressing down on the spindle while lifting the outer edges of the disc. Handle the disc by the edges, not the flat surfaces. If the media tray is not fully extended, tilt the disc as you remove it. Place the disc in a protective case.

4. Close the media tray.

Displaying Optical Disc Contents

When an optical disc is inserted into a drive, the contents of the disc display on the screen when Autorun is enabled.

To display the contents of a disc when Autorun is not enabled:

1. Click **Start > Run.** Then enter x (where *x* is your CD drive designation).

2. Press **enter.**

Avoiding Standby or Hibernation

Ʌ **CAUTION:** To prevent possible video degradation and loss of audio or video playback functionality, do not initiate standby or hibernation while playing any type of media.

If standby or hibernation is accidentally initiated while a drive medium (such as a CD, CD-RW, DVD, or digital media) is in use, the following results may occur:

■ Your playback may be interrupted.

■ You may see the following warning: "Putting the computer into hibernation or standby may stop the playback. Do you want to continue?" Select **No.**

Restore from hibernation or resume from standby by pressing the power button. Audio or video may resume or you may need to restart the medium.

Using PC Cards

⚠ **CAUTION:** If you install software or enablers provided by a PC Card manufacturer, you may not be able to use other PC Cards. If you are instructed by the documentation included with your PC Card to install device drivers:

■ Install only the device drivers for your operating system.

■ Do not install other software, such as card services, socket services, or enablers, that may also be supplied by the PC Card manufacturer.

✎ Your notebook may look slightly different from the illustrations in this section.

A PC Card is a credit card–sized accessory designed to conform to the standard specifications of the Personal Computer Memory Card International Association (PCMCIA).

■ The notebook supports 32-bit (CardBus) and 16-bit PC Cards.

■ The notebook is equipped with 1 or 2 PC Card slots. If your notebook model has 1 PC Card slot, it supports 1 Type I card, 1 Type II card, or 1 Type III card. If your notebook model has 2 PC Card slots, it supports 2 Type I or Type II cards, or 1 Type III card.

   ✎ If your notebook is equipped with 1 slot, you must insert a Type I or II PC card into the lower slot. If you insert it into the upper slot, the PC card will not work. If you are using a Type III PC card on a notebook with 1 slot, you must manually remove the protective cover on the slot prior to inserting the card.

■ Zoomed video PC Cards are not supported.

Inserting a PC Card

⚠ **CAUTION:** To prevent damage to the connectors:
■ Use minimal pressure when inserting a PC Card into a PC Card slot.
■ Do not move or transport the notebook while a PC Card is inserted.

1. Hold the PC Card label side up with the connector facing the notebook.
2. Gently slide the card into the slot until the card is seated. The operating system will issue a sound to indicate that a device has been detected.
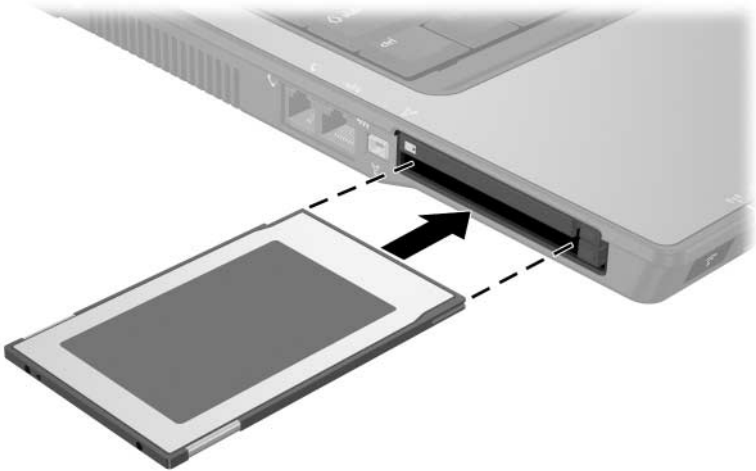
Removing a PC Card

⚠ **CAUTION:** To prevent loss of work or an unresponsive system, stop the PC Card before removing it.

1. Stop the PC Card by selecting the **Safely Remove Hardware** icon in the notification area (at the far right of the taskbar), and then select the PC Card. (To display the Safely Remove Hardware icon, select **Show Hidden Icons** in the notification area.)

2. Press the PC Card slot eject button ❶. (This action extends the button into position for releasing the PC Card.)

3. To release the PC Card, press the extended PC Card slot eject button.

4. Gently slide out the card ❷.
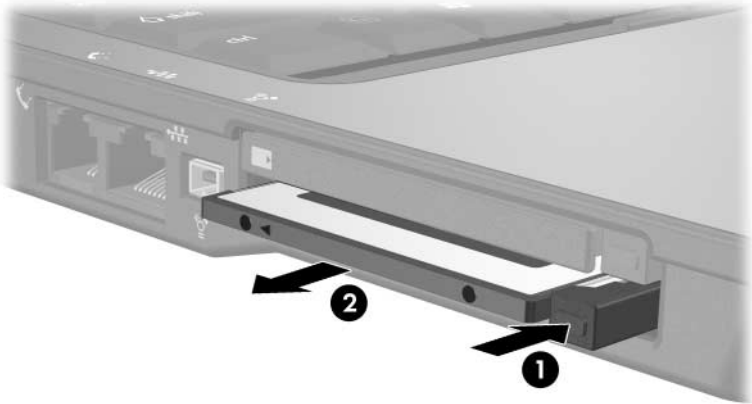
✎ An inserted PC Card uses power even when not in use. To conserve power, stop or remove a PC Card when you are not using it.

Using Digital Memory Cards (Select Models Only)

Optional digital memory cards are removable storage cards that provide a convenient method of storing data and sharing it with other devices such as PDAs and cameras.

The optional 6-in-1 Digital Media Slot supports the following digital memory card formats:

■ Secure Digital (SD) Memory Card

■ MultiMediaCard

■ Memory Stick

■ Memory Stick Pro

■ SmartMedia Card

■ xD-Picture Card

Inserting an Optional Digital Memory Card

△ **CAUTION:** To prevent damage to the connectors to the digital memory card connectors, use minimal pressure when inserting a digital memory card into a Digital Media Slot.

To insert a digital memory card:

1. Hold the digital memory card label-side up with the connectors facing the notebook.

2. Slide the memory card into the Digital Media Slot until the card is seated.
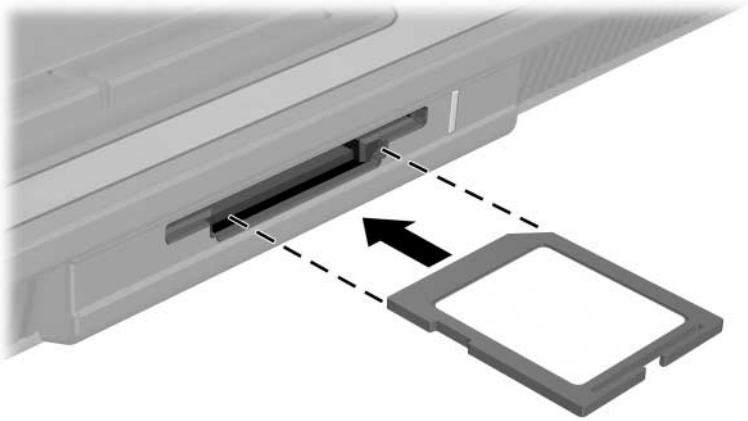
Removing an Optional Digital Memory Card

⚠ **CAUTION:** To prevent loss of work or system lockup, stop the digital memory card before removing it.

To remove a digital memory card:

1. Close all files and applications using the digital memory card. (To stop a data transfer, select the cancel button in the operating system Copying window.)

2. Pull the digital memory card out of the slot.
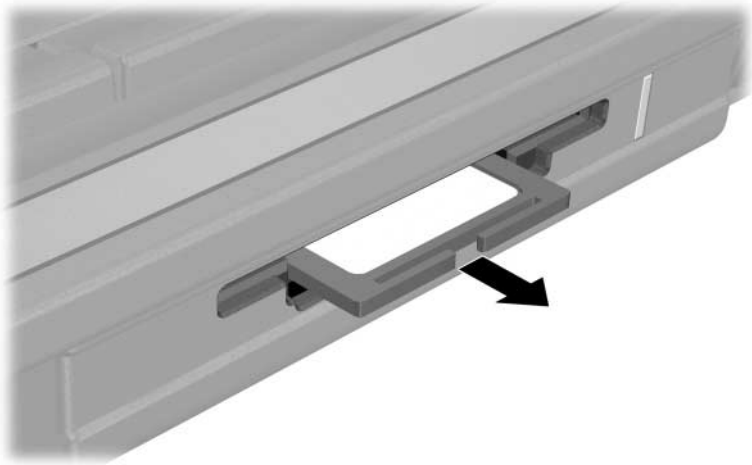
Adding and Upgrading Memory Modules

⚠ **WARNING:** The memory module compartments are the only user-accessible internal compartments on the notebook. All other areas that require a tool to open should be opened only by a service partner.

⚠ **WARNING:** Failure to unplug the power cord and remove all battery packs before installing a memory module can damage the equipment and expose you to the risk of electrical shock.

⚠ **CAUTION:** Electrostatic discharge (ESD) can damage electronic components. Before beginning any procedure, ensure that you are discharged of static electricity by touching a grounded metal object. For more information, refer to *Regulatory and Safety Notices* on the *Notebook Documentation* CD.

The notebook has 2 memory module compartments. The primary memory module compartment is located under the keyboard. The expansion memory module compartment is located on the bottom of the notebook.

The memory capacity of the notebook can be upgraded by adding a memory module to the expansion slot or by upgrading the existing memory module in the primary memory slot.

Adding a Memory Module to the Expansion Memory Module Slot

To add or replace a memory module in the expansion memory module slot:

1. Shut down the notebook. (If you are not sure whether the notebook is off or in hibernation, turn the notebook on by pressing the power button. Then shut down the notebook through the operating system.)

2. Disconnect all external devices connected to the notebook.

3. Disconnect the power cord.

4. Turn the notebook upside down.

5. Remove any battery packs from the notebook.

6. Loosen the memory module cover screw ❶.

7. Lift the memory module cover ❷ away from the notebook.
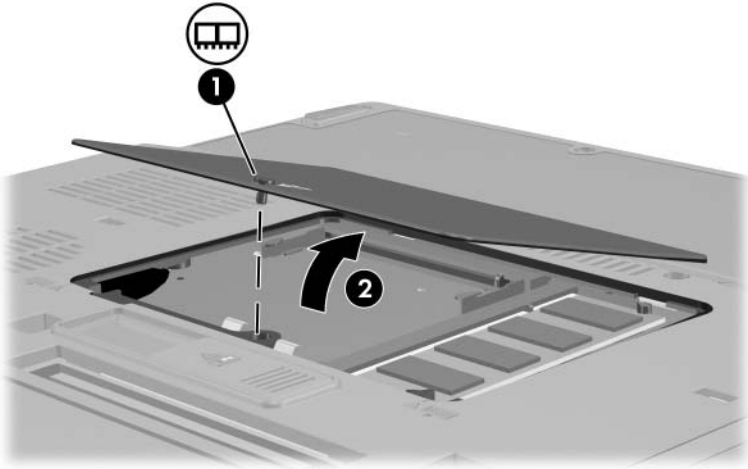
8. If there is a memory module in the expansion memory module slot, remove it:

   a. Pull away the retention clips on each side of the memory module ❶. (The memory module tilts upward.)

   b. Grasp the edges of the memory module and gently pull the module out of the memory slot ❷. To protect a memory module after removal, place it in an electrostatic-safe container.
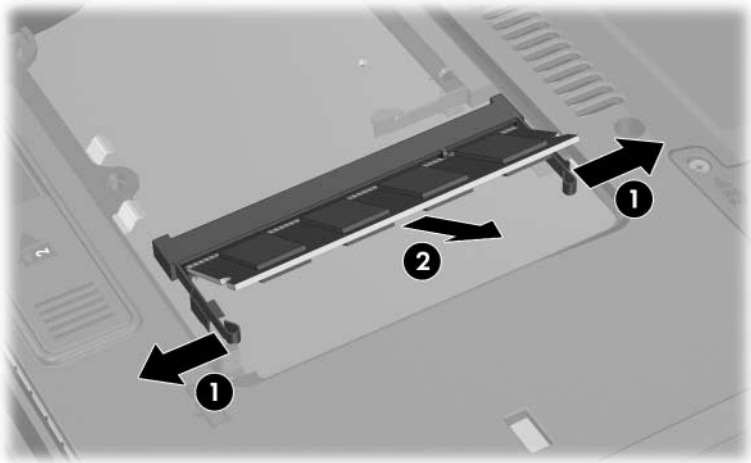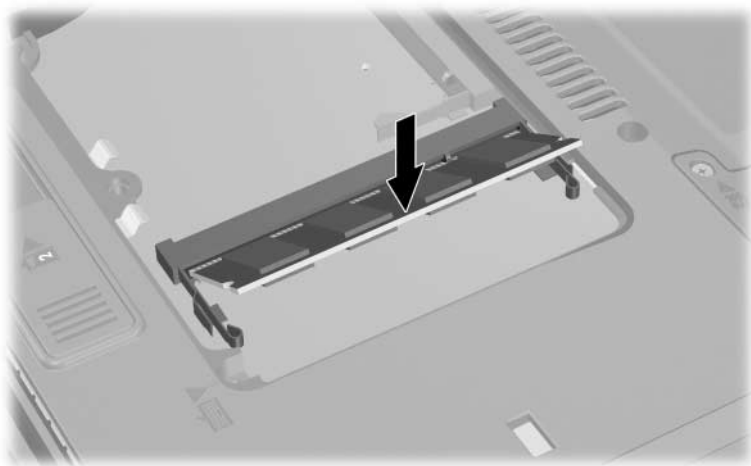
9. Insert the new memory module:

   a. Align the keyed (notched) edge ❶ of the memory module with the tabbed area in the memory slot.

   b. With the memory module at a 45-degree angle from the surface of the memory module compartment, press the module into the memory slot until it is seated ❷.
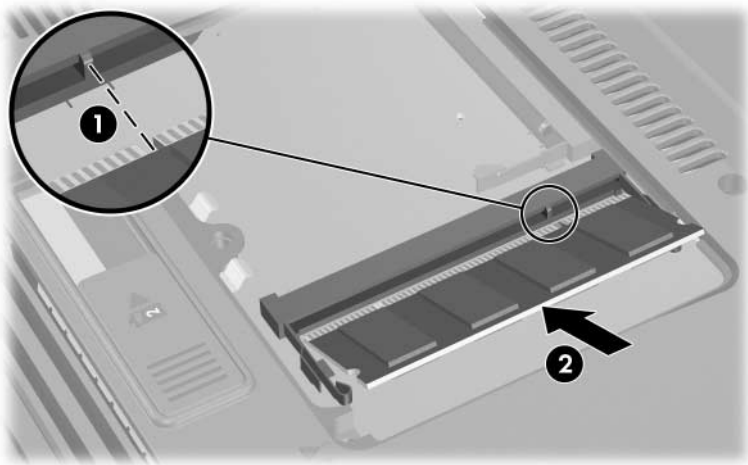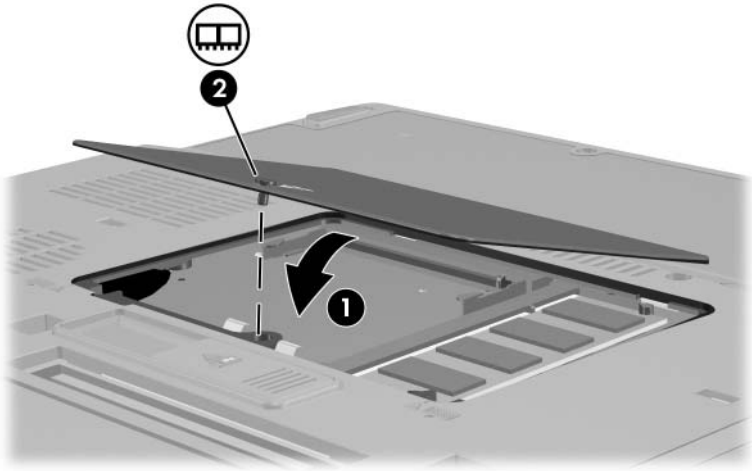
c. Push the memory module downward until the retention clips snap into place.

10. Replace the memory module cover ❶ and tighten the memory module cover screw ❷.

11. Replace the battery pack.
12. Reconnect external power and external devices.
13. Restart the notebook.

# Upgrading the Memory Module in the Primary Memory Module Slot

✎ Your notebook may look slightly different from the illustrations in this section.

To add a memory module to the primary memory module slot:

1. Shut down the notebook. (If you are not sure whether the notebook is off or in hibernation, turn the notebook on by pressing the power button. Then shut down the notebook through the operating system.)

2. Disconnect all external devices connected to the notebook.

3. Disconnect the power cord.

4. Remove any battery packs from the notebook.

5. Turn the notebook upside down.

6. Loosen the memory module cover screw ❶.

7. Lift the memory module cover ❷ away from the notebook.
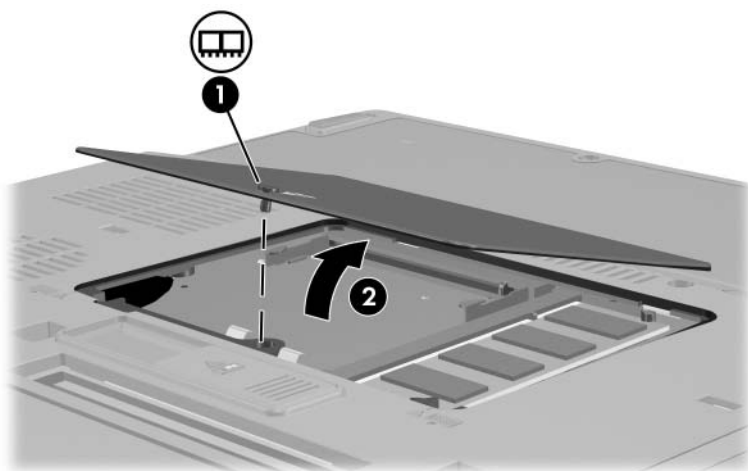
8. Remove the 2 keyboard screws.
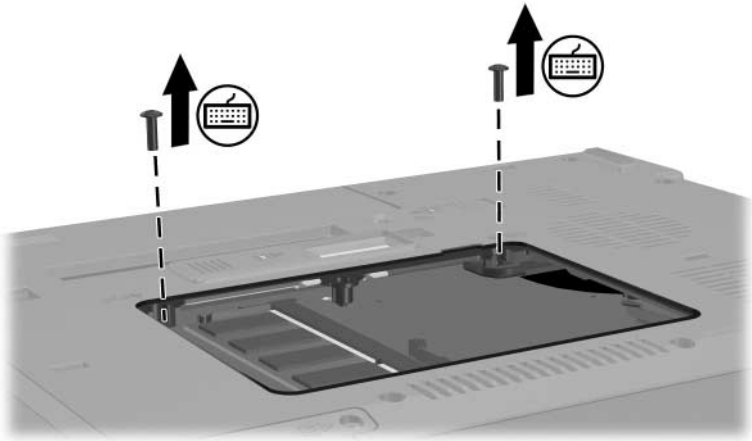
9. Turn over the notebook and open it.

10. Slide the 4 keyboard latches to release the keyboard.

11. Gently lift the top edge of the keyboard and tilt the keyboard over until it rets on the palm rest of the notebook.
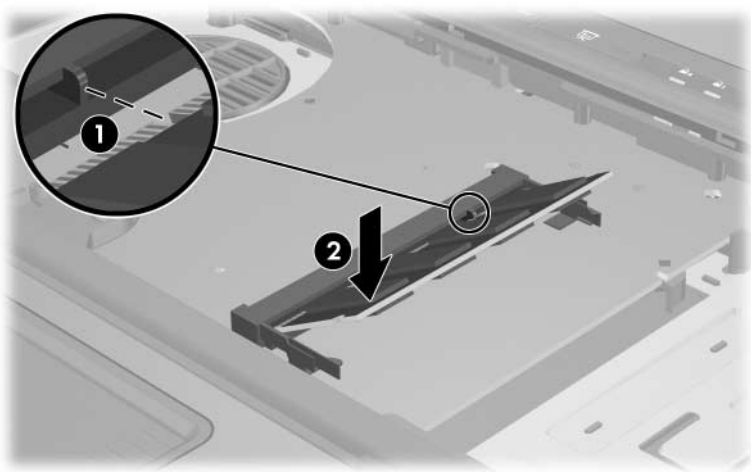
12. Remove the memory module from the memory module slot:

    a. Pull the retention clips ❶ away from each side of the memory module. The memory module tilts upward when released.

    b. Lift the edge of the memory module ❷ and gently remove it from the slot. To protect a memory module after it has been removed, place it in an electrostatic-safe container.
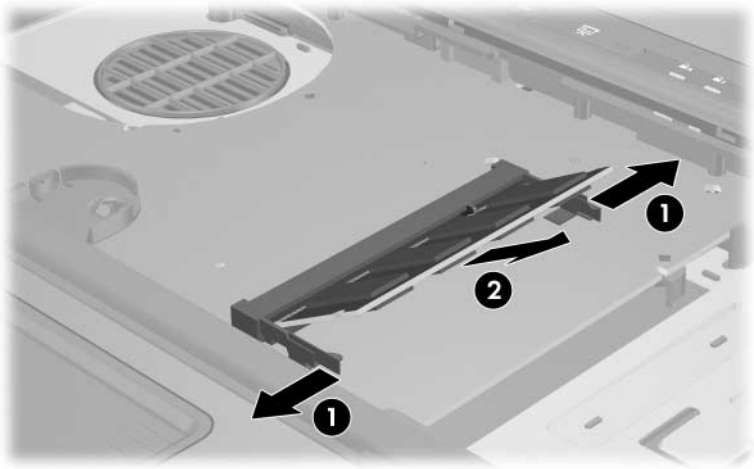
13. Insert the new memory module into the memory module slot:

    a. Align the keyed (notched) edge of the memory module ❶ with the keyed area in the memory module slot.

    b. With the memory module at a 45-degree angle from the surface of the memory module compartment, press the module into the memory slot until it is seated ❷.
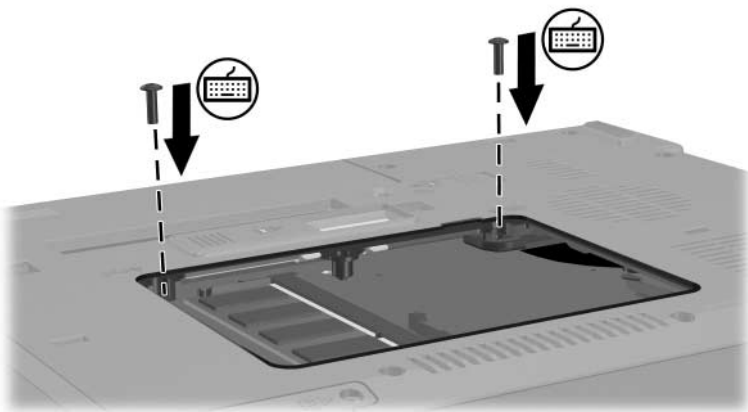
c. Press the memory module downward until the retention clips snap into place.
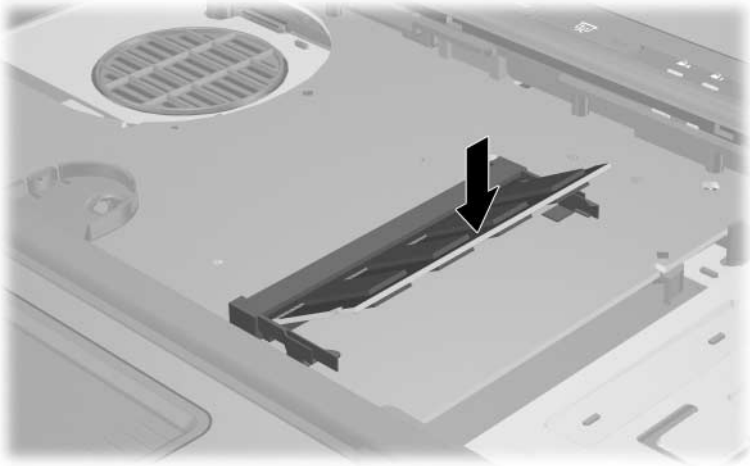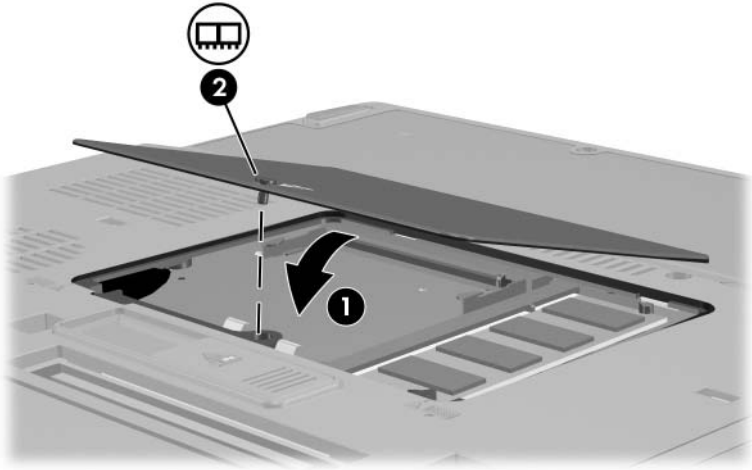
14. Replace the keyboard and slide the keyboard latches up to lock them.

15. Replace the keyboard access screws located on the bottom of the notebook.

16. Replace the memory module cover ❶ and the memory module cover screw ❷.

17. Replace the battery pack.

18. Reconnect the external power and external drives.

19. Restart the notebook.

Effects of Increasing Memory

When random access memory (RAM) increases, the operating system increases the hard drive space reserved for the hibernation file.

If you experience problems with hibernation after increasing RAM, verify that your hard drive has enough free space to accommodate a larger hibernation file.

■ To display the amount of RAM in the system:

❏ Select **Start > Control Panel > Performance and Maintenance > System > General** tab.

– or –

❏ Press **fn+esc.**

■ To display the amount of free space on your hard drive:

Double-click the **My Computer** icon on the Windows desktop. Then select your hard drive. (Information about the space on the drive is displayed in a status bar at the bottom of the window.)

■ To display the amount of space required by the hibernation file:

Select **Start > Control Panel > Performance and Maintenance > Power Options > Hibernate** tab.

Connecting a Modem Cable

⚠️ **WARNING:** Connecting the notebook to a digital line can permanently damage the modem. Immediately disconnect your modem cable if you accidentally connect it to a digital line.

A modem cable, which has a 6-pin RJ-11 connector at each end, must be connected to an analog telephone line. In some countries, a country-specific modem adapter is required. Jacks for digital PBX systems may resemble analog telephone jacks, but are not compatible with the modem.

✎ Your notebook may look slightly different from the illustrations in this section.
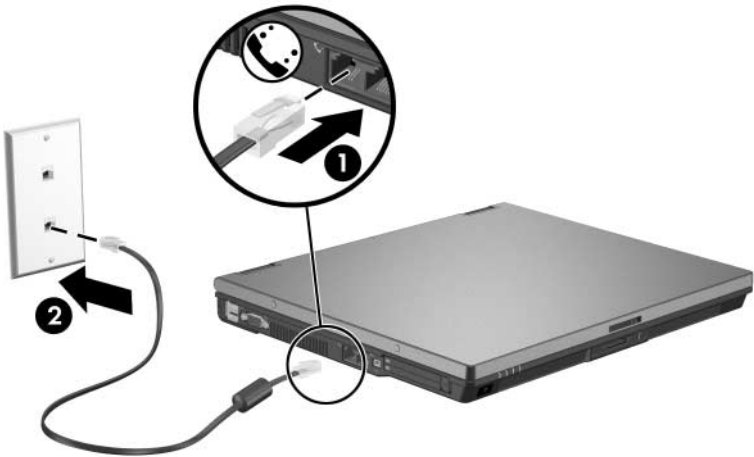
Using a Modem Cable

⚠ **WARNING:** To avoid the risk of electrical shock, fire, or damage to the equipment, do not plug a modem cable into the network jack.

To connect a modem cable:

1. Plug the modem cable into the modem jack ❶ on the notebook.
2. Plug the modem cable into the RJ-11 telephone wall jack ❷.

For more information about using the modem or about using AT commands and dial modifiers, refer to the modem guides on the *Notebook Documentation* CD.

Using a Country-Specific Adapter

⚠ **WARNING:** To avoid the risk of electrical shock, fire, or damage to the equipment, do not plug a telephone cable into the network jack.

Telephone jacks vary by country. To use the modem and the modem cable outside the country in which you purchased the notebook, you must obtain a country-specific modem adapter. Refer to the modem guides on the *Notebook Documentation* CD for more details about using your notebook internationally.

To connect the modem to an analog telephone line that does not have an RJ-11 telephone jack:

1. Plug the modem cable into the modem jack ❶ on the notebook.
2. Plug the modem cable into the country-specific modem adapter ❷.
3. Plug the country-specific modem adapter ❸ into the telephone wall jack.

Connecting a Network Cable

✎ Your notebook may look slightly different from the illustration in this section.

A network cable has an 8-pin RJ-45 connector at each end.

To connect the network cable:

1. Plug the network cable into the network jack ❶ on the notebook.

2. Plug the other end of the cable into a network wall jack ❷.

Linking to An Infrared Device (Select Models Only)

The notebook is IrDA compliant—4 megabits per second (Mbps) standard—and can communicate with another infrared-equipped device that is also IrDA compliant.

The infrared port supports both low-speed connections of up to 115 kilobits per second (Kbps) and high-speed connections of up to 4 Mbps. Infrared performance may vary depending on the performance of infrared peripherals, distance between infrared devices, and applications used.

Infrared signals are sent through an invisible beam of infrared light and require an unobstructed line-of-sight path.

Setting Up an Infrared Transmission

For information about using infrared software, refer to your operating system Help file.

To set up infrared devices for optimal transmission:

■ Prepare the infrared ports on both devices for transmission.

■ Position the devices so that their infrared ports face one another at a distance no greater than 1 meter (3.3 feet).

■ Position the ports so that they face one another directly. Because the maximum capture angle is 30 degrees, the ports must be aligned no more than 15 degrees off-center.

■ Shield the ports from direct sunlight, flashing incandescent light, and energy-saving fluorescent light.

■ Be sure that no signals from remote control or other wireless devices, such as headphones or audio devices, aim at a port.

■ During the transmission, do not move either device and do not allow objects or movement to disrupt the beam.

Using Standby with Infrared

Standby is not compatible with infrared transmission. If the notebook is in standby, an infrared transmission cannot be initiated. If standby is initiated during an infrared transmission, the transmission stops. To resume from standby, press the power button. The transmission resumes when the notebook resumes from standby. However, any program that was using the infrared transmission when standby was initiated may not continue at the point it was stopped. For example, if a program was printing when standby was initiated, the program resumes transmission after the notebook resumes, but the print job may not resume.
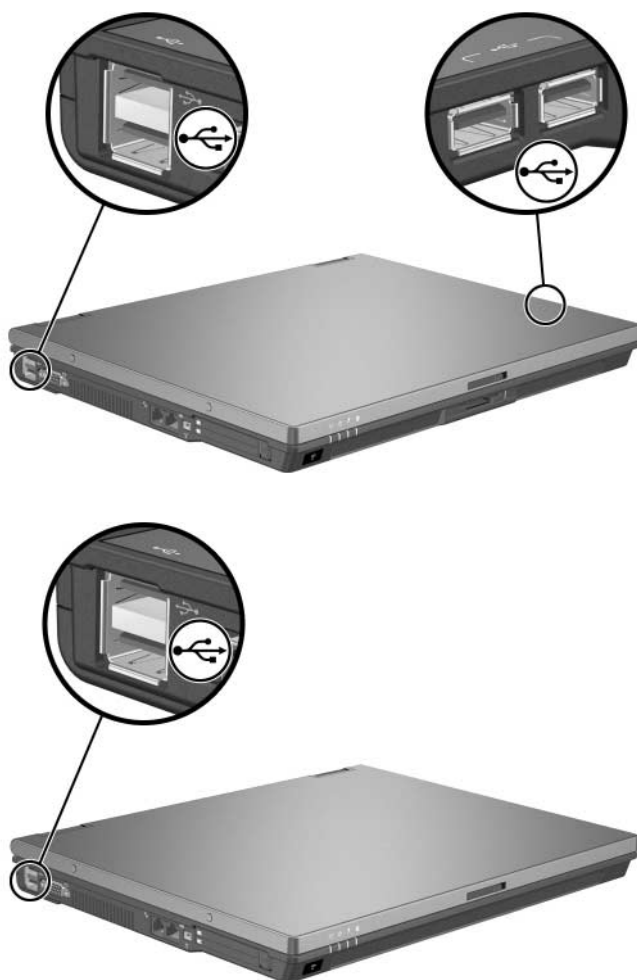
Connecting a USB Device

Universal Serial Bus (USB) is a hardware interface that can be used to connect external devices, such as a USB keyboard, mouse, drive, printer, scanner, or hub, to the notebook. Depending on your notebook model, the notebook has 2 or 4 standard USB connectors that support USB 2.0 and USB 1.1 devices.

✎ The following illustrations identify the standard external features included in most notebook models. Refer to the illustration that most closely matches your notebook model.

USB hubs can be connected to a USB port on the notebook or on an optional docking device (select models only), or to other USB devices. Hubs support varying numbers of USB devices and are used to increase the number of USB devices in the system. Powered hubs must be connected to external power. Unpowered hubs must be connected either to a USB port on the notebook or to a port on a powered hub.

Using a USB Device

A USB device functions in the same way as a comparable non-USB device, with one exception. By default, USB devices do not function unless an operating system that supports USB is installed in the notebook.

Some USB devices may require additional support software, which is usually included with the device. For more information and software installation instructions, refer to the documentation included with the device.

Enabling USB Legacy Support

You must enable USB legacy support to

■ Use a USB keyboard, mouse, or hub connected to a USB port on the notebook during startup or in a non-Windows application or utility.

■ Boot from an optional external MultiBay.

To enable USB legacy support:

1. Turn on or restart the notebook.

2. Press **f10** while the F10 = ROM Based Setup message is displayed in the lower-left corner of the screen.

   ❏ To change the language, press **f2.**

   ❏ For navigation instructions, press **f1.**

3. Select **Advanced** menu **> Device Options.**

4. Select **Enable USB legacy support.**

5. To save your preference and exit Computer Setup, select **File > Save Changes and Exit,** and then follow the instructions on the screen.

Connecting Optional External Devices

The jacks and connectors described in this guide support standard external devices.

■ For information about which jack or port to use, refer to the documentation included with the device.

■ For information about installing or loading any software required by the device, such as drivers, refer to the documentation included with the device.

To connect a standard external device to the notebook:

1. Save your work and turn off the notebook.

2. If you are connecting a powered device, turn off the device.

3. Connect the device to the notebook.

4. If you are connecting a powered device, plug the device power cord into a grounded electrical outlet.

5. Turn on the device.

6. Turn on the notebook.

To disconnect a standard external device from the notebook, turn off the device, and then disconnect it from the notebook.

Connecting an Optional External MultiBay and External MultiBay II

An external MultiBay or MultiBay II connects to the notebook USB port and enables you to use MultiBay and MultiBay II devices. The notebook does not provide power to the External MultiBay. An External MultiBay must be connected to AC power. For more information about the External MultiBay, refer to the documentation that is included with the device.

Mobile Printing for Notebooks

Mobile Printing for Notebooks enables you to print to any PostScript-enabled HP network printer, even if the notebook does not have the needed printer driver.

To print using Mobile Printing:

1. Select **File > Print** from any application.
2. Select **HP Mobile Printing** from the list of printers.
3. Select **Print.**
4. Enter the printer's IP address or network path.
5. Select **Print.**

For more information on downloading and using Mobile Printing, visit the HP Web site at http://www.hp.com/go/mobileprinting.

6

Wireless

If your notebook is equipped with one or more integrated wireless devices such as 802.11 or Bluetooth wireless devices, you have a wireless notebook.

■ An 802.11 wireless notebook can connect to wireless networks in corporate offices, your home, and public places. Wireless networks include wireless local area networks (WLANs) or "hotspots." Hotspots are wireless access points available in public places such as airports, restaurants, coffee shops, hotels, and universities.

■ A Bluetooth wireless notebook can connect to other Bluetooth wireless-enabled devices using a wireless personal area network (PAN).

Your notebook has a button that can be used to enable and disable 802.11 and Bluetooth wireless devices and an associated light to indicate the state of the wireless devices.

✎ Components included with your notebook may vary by geographical region and by model. The illustrations in this chapter identify the standard external features included in most notebook models. Refer to the illustration that most closely matches your notebook.

In addition to the wireless button and light, your notebook has software controls that enable you to turn on, turn off, enable, and disable your wireless devices. The following table explains the software controls.

Wireless Control	Description
Wireless Assistant	Is a software utility that enables you to turn on and off 802.11 and Bluetooth wireless devices individually. For more information on using Wireless Assistant, refer to the "Turning On, Turning Off, Enabling and Disabling the 802.11 and Bluetooth Wireless Devices" section in this chapter.
Computer Setup controls	Enable and disable 802.11 and Bluetooth wireless devices in Computer Setup. For more information about using Computer Setup to control 802.11 and Bluetooth wireless devices, refer to Chapter 9, "Computer Setup."

Wireless Local Area Network (Select Models Only)

With the 802.11 wireless device, you can access a wireless local area network (WLAN), which is composed of other computers and accessories linked by a wireless router or a wireless access point.

■ A large scale WLAN, such as a corporate WLAN or public WLAN hotspot, typically uses wireless access points that can handle a large number of computers and accessories and can separate critical network functions.

■ A home or small office WLAN typically uses a wireless router, which enables several wireless and wired computers to share an Internet connection, a printer, and files without additional pieces of hardware or software. *Wireless access point* and *wireless router* are often used interchangeably.

Notebooks with 802.11 WLAN devices may support one or more of 3 IEEE physical layer standards:

■ 802.11a

■ 802.11b

■ 802.11g

There are 3 popular implementations of WLAN adapters:

■ 802.11b only

■ 802.11b/g

■ 802.11a/b/g

802.11b, the first popular WLAN standard, supports data rates of up to 11 Mbps and operates at a frequency of 2.4 GHz. 802.11g, which came later, also operates at 2.4 GHz but supports data rates of up to 54 Mbps. An 802.11g WLAN device is backward compatible with 802.11b devices, so they can operate on the same network. 802.11a supports data rates of up to 54 Mbps but operates at a frequency of 5 GHz. 802.11a is not compatible with 802.11b and 802.11g. For information on identifying the type of device in your notebook, refer to the "Identifying a WLAN Device" section in this chapter.

Connecting Your Wireless Notebook to a Corporate WLAN

Contact your network administrator or IT department for information on connecting your notebook to your corporate WLAN.

Connecting Your Wireless Notebook to a Public WLAN

Contact your ISP or search the Web for a list of public WLANs near you. Web sites that list public WLANs include Cisco Hotspot Locator, Hotspotlist, and Geektools.

When you are within range of a public WLAN, a Wireless Network Connection interactive message is displayed at the bottom of the screen. Check with each public WLAN location for cost and connection requirements.

Setting Up a WLAN in Your Home

To set up a WLAN and connect to the Internet in your home, you need the following equipment. The following illustration shows an example of a completed wireless network installation that is connected to the Internet. This wireless network includes

■ An optional broadband modem (either DSL or cable) and high-speed Internet service purchased from an Internet service provider (ISP) ❶.

■ An optional wireless router (purchased separately) ❷.

■ Your wireless notebook ❸.
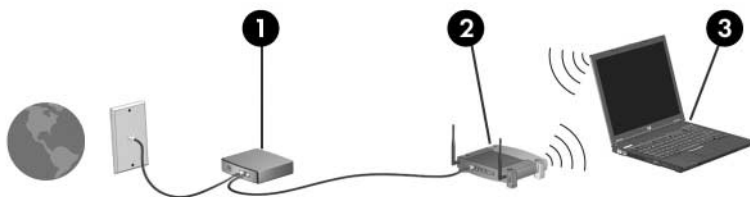
As this network grows, additional wireless and wired computers can be connected to the network to access the Internet.

✎ If you need technical assistance to install your WLAN, contact the router manufacturer or your ISP.

Using a WLAN Connection

To use a WLAN connection:

■ Verify that all drivers required by the 802.11 wireless device are installed and that the 802.11 wireless device is correctly configured.

✎ If you are using an integrated 802.11 wireless device, all required drivers are installed and the adapter is preconfigured and ready for use.

■ If you are using an integrated 802.11 wireless device, verify that the 802.11 wireless device is turned on. When the 802.11 wireless device is turned on, the wireless light is turned on. If the wireless light is off, turn on the 802.11 wireless device. Refer to the "Turning On, Turning Off, Enabling and Disabling the 802.11 and Bluetooth Wireless Devices" section.

■ For your home WLAN, verify that your router is correctly configured. For instructions, refer to your router documentation.

✎ Functional range for subsequent WLAN connections vary, depending on your notebook WLAN implementation, router manufacturer, and interference from varying types of walls and other electronic devices.

For more information about using a WLAN connection:

■ Refer to information from your ISP and the documentation included with your wireless router and other WLAN equipment.

■ Access the information and Web site links provided at **Start > Help and Support.**

■ Refer to the documentation included with your notebook. The *Troubleshooting* guide on the *Notebook Documentation* CD contains a section about wireless LAN device problems and resolutions.

Using Wireless Security Features

When you set up your own WLAN or access an existing WLAN, always ensure that security features are protecting the WLAN. If you do not enable security on your WLAN, an unauthorized wireless user can access your notebook data and use your Internet connection without your knowledge.

The most common security levels are Wi-Fi Protected Access (WPA)-Personal and Wired Equivalent Privacy (WEP). In addition to enabling WPA-Personal or WEP security encryption on the router, you may want to use one or more of the following security measures:

■ Change the default network name (SSID) and password.

■ Use a firewall.

■ Set security on your Web browser.

■ Enable MAC address filtering on the router.

For more information about WLAN security, refer to the HP Web site at http://www.hp.com/go/wireless for details.

Installing Wireless Software (Optional)

Microsoft Windows XP uses its Zero Client Configuration feature to support WLAN configuration. HP provides a separate WLAN configuration utility that must be installed if you plan to use Cisco Compatible Extensions. Cisco Compatible Extensions enable wireless devices to use Cicso-based WLANs.

Identifying a WLAN Device

To install HP WLAN software for an integrated 802.11 wireless device, you need to know the name of the integrated 802.11 wireless device on your notebook. To identify an integrated 802.11 wireless device:

1. Display the names of all the 802.11 wireless devices on your notebook:

   a. Select **Start > My Computer.**

   b. Right-click in the My Computer window.

   c. Select **Properties > Hardware** tab > **Device Manager > Network Adapters.**

2. Identify the 802.11 wireless device from the list that is displayed:

   ❏ The listing for an 802.11 wireless device includes the term *wireless LAN, WLAN,* or *802.11.*

   ❏ If no 802.11 wireless device is listed, either your notebook does not have an integrated 802.11 wireless device, or the driver for the 802.11 wireless device is not properly installed.

Accessing WLAN Software and Documentation

Your WLAN software is preloaded on your notebook and is available in the Software Setup utility.

To install the WLAN software:

» Select **Start > All Programs > Software Setup,** and then follow the instructions on the screen. (When you are prompted to select the software you want to install, select or clear the corresponding check boxes.)

The WLAN software is also available as a SoftPaq at the HP Web site. To access, download, and install the SoftPaq, use either of the following procedures:

■ Select **Start > Help and Support.**

– or –

■ Visit the HP Web site at http://www.hp.com/support:

   a. Choose your language and region.

   b. Select **Download Drivers and Software.**

   c. Enter your computer model information, and then follow the instructions provided at the Web site.

   ✎ WLAN software is provided in the Network category. To access model information about your computer, refer to the serial number label. The serial number label is on the bottom of the notebook.

To access documentation for your WLAN software:

1. Install the WLAN software as instructed earlier in this chapter.

2. Open the utility.

3. Select **Help** on the menu bar.

Troubleshooting 802.11 Wireless Devices

For more troubleshooting information, visit the HP Web site at http://www.hp.com/go/wireless or refer to the documentation included with your notebook. The *Troubleshooting* guide on the *Notebook Documentation* CD contains a section about wireless LAN device problems and resolutions.

Bluetooth Wireless Device (Select Models Only)

A Bluetooth wireless device provides short-range wireless communications that replace the physical cable connections that traditionally link electronic devices such as

■ Network access points.

■ Computers (desktop, notebook, PDA).

■ Phones (cellular, cordless, smart phone).

■ Imaging devices (printer, camera).

■ Audio devices (headset, speakers).

The devices are represented in the Bluetooth for Windows software by graphical icons that resemble their physical features, which makes them easily recognizable and distinguishes them from other classes of devices.

The Bluetooth for Windows software provides the following functions:

■ Personal Information Management (PIM) item transfer—Sends and receives information files such as business cards, calendar items, notes, and message items to and from another Bluetooth computer or device.

■ PIM synchronization—Synchronizes PIM data between a computer, PDA, or cell phone using Bluetooth.

■ File Transfer—Sends and receives files to and from another Bluetooth computer.

■ Network access (Personal Area Networking Profile)—Enables 2 or more Bluetooth devices to form an ad-hoc (peer-to-peer) network. Provides a mechanism that enables a Bluetooth device to access a remote network through a network access point. The network access points can be traditional LAN data access points or group ad-hoc networks that represent a set of devices that are attached only to one another.

■ Dial-up networking—Connects Bluetooth devices to the Internet.

■ Bluetooth serial port—Transfers data over the Bluetooth link using a virtual COM port.

■ Hands-Free—Enables a vehicle-embedded, hands-free unit or a notebook serving as a hands-free unit to establish a wireless connection to a cellular phone and to act as the Bluetooth cellular phone audio input and output mechanism.

■ Basic imaging—Provides a wireless connection between a Bluetooth-enabled camera and other Bluetooth devices. The camera can be controlled remotely by a notebook, and images can be transferred from a camera to be stored on a computer or to be printed.

■ Human interface device—Provides a wireless connection to other Bluetooth devices, such as keyboards, pointing devices, gaming devices, and remote monitoring devices.

■ Fax—Provides a Bluetooth connection that enables a notebook to send or receive a fax message using a Bluetooth cellular phone or modem.

■ Headset—Provides a wireless connection between a headset and a notebook or cellular phone. The headset acts as the device's audio input and output mechanism and increases mobility.

For more information about using Bluetooth with your notebook, refer to the *Wireless Documentation* CD included with your notebook.

Turning On, Turning Off, Enabling and Disabling the 802.11 and Bluetooth Wireless Devices

The wireless button enables and disables 802.11 and Bluetooth wireless devices in conjunction with Wireless Assistant. By default, the 802.11 and Bluetooth wireless devices and wireless light are turned on when you turn on the notebook.

✎ Turning on a wireless device does not automatically create a WLAN or connect you to a WLAN. For information on setting up a WLAN refer to the "Wireless Local Area Network (Select Models Only)" section in this chapter.

The 802.11 and Bluetooth wireless devices have 2 power states:

■ Enabled

■ Disabled

You can enable and disable wireless devices in Computer Setup. For more information about using Computer Setup to control the 802.11 and Bluetooth wireless devices, refer to Chapter 9, "Computer Setup." You can also enable and disable a wireless device with the wireless button.

When the wireless devices are enabled in Computer Setup and with the wireless button, you can use Wireless Assistant to turn on and off the devices individually.

To view the state of your wireless devices, place the cursor over the Wireless Assistant icon in the notification area, or open Wireless Assistant by double-clicking the icon in the notification area. Wireless Assistant displays the status of the devices as on, off, or disabled. Wireless Assistant also displays the status of the devices in Computer Setup as enabled or disabled.

For more information about Wireless Assistant:

1. Open Wireless Assistant by double-clicking the icon in the notification area.

2. Select the **Help** button.

✎ You cannot use the wireless button or Wireless Assistant to control the wireless devices if they are disabled in Computer Setup.

Turning On the 802.11 Wireless and Bluetooth Devices

If	And	Then
■ Wireless Assistant shows that both WLAN and Bluetooth are off ■ Wireless light is off	You want to turn on either or both devices	1. Right-click the **Wireless Assistant** icon in the notification area. 2. Select the device or devices you want to turn on. ✎ If the wireless devices are turned off, pressing the wireless button disables both devices. The button does not turn on the devices.
■ Wireless Assistant shows that both WLAN and Bluetooth are disabled* ■ Wireless light is off	You want to turn on either or both devices	1. Press the wireless button. (The devices return to their previous on or off state.) 2. If the wireless devices are turned off, right-click the **Wireless Assistant** icon in the notification area. 3. Select the device or devices you want to turn on.

(Continued)

If	And	Then
■ Wireless Assistant shows that one device is on and the other device is off ■ Wireless light is on	You want to turn on either or both devices	1. Right-click the **Wireless Assistant** icon in the notification area. 2. Select the device or devices you want to turn on.

*If the wireless devices are not both on when you disable the devices, pressing the wireless button again returns the devices to their previous on or off state. Pressing the button does not turn on both devices.

✎ If you want your wireless devices to be turned on when you turn on your notebook, you must turn them on before you shut down or restart.

Turning Off and Disabling the 802.11 Wireless and Bluetooth Devices

If	And	Then
■ Wireless Assistant shows that both WLAN and Bluetooth are on ■ Wireless light is on	You want to disable both devices	Press the wireless button.
	You want to turn off either or both devices	1. Right-click the **Wireless Assistant** icon in the notification area. 2. Select the device or devices you want to turn off.
■ Wireless Assistant shows that both WLAN and Bluetooth are off ■ Wireless light is off	You want to disable both devices	Press the wireless button.
■ Wireless Assistant shows that one device is on and the other device is off* ■ Wireless light is on	You want to disable both devices	Press the wireless button.
	You want to turn off both devices.	1. Right-click the **Wireless Assistant** icon in the notification area. 2. Select the device or devices you want to turn off.

*If the wireless devices are not both on when you disable the devices, pressing the wireless button again returns the devices to their previous on or off state. Pressing the button does not turn on both devices.

7

Security

Security Features

✎ Security solutions are designed to act as deterrents. These deterrents may not prevent a product from being mishandled or stolen.

The security features provided with your notebook can protect the notebook, personal information, and data from a variety of risks. Depending on your environment, some security features may be unnecessary.

In addition to the Windows operating system security measures, the following table may help you decide which other security features to use.

Most of these additional security features can be configured in the Setup utility. For more information, refer to Chapter 9, "Computer Setup" in this guide.

To Protect Against	Use This Security Feature
Unauthorized use of the notebook	■ Power-on password* ■ ProtectTools Security Manager Refer to the "ProtectTools Security Manager (Select Models Only)" section in this chapter for additional information.
Unauthorized access to the Computer Setup utility (**f10**)	HP administrator password*
Unauthorized access to the contents of a hard drive	DriveLock*
Unauthorized startup from an optical drive, diskette, or internal network adapter boot	Device security*
Unauthorized access to a Windows user account	■ Optional smart cards An enabled smart card can store both the Windows user password and the Windows administrator password; therefore, both the smart card and the smart card PIN are required to access the account. ■ Credential Manager for ProtectTools Refer to the "Credential Manager for ProtectTools" section in this chapter for more information. ✎ This security feature is supported by only certain smart card readers.
Unauthorized access to data	■ HP administrator password ■ Windows Firewall software ■ Windows updates ■ ProtectTools Security Manager Refer to the "ProtectTools Security Manager (Select Models Only)" section in this chapter for additional information.

(Continued)

To Protect Against	Use This Security Feature
Unauthorized access to the BIOS settings and other system identification information	HP administrator password
Unauthorized removal of the notebook	Security cable slot (used with an optional security cable).
	For more information on the security cable slot, refer to the "Optional Security Cable" section in this chapter.

*This security feature is configured in Computer Setup. Computer Setup is a non-Windows utility accessed by pressing **f10** when the notebook is started or restarted. The procedures for using Computer Setup to set specific security preferences are provided in this chapter. For information about displaying system information and using other Computer Setup features, refer to Chapter 9, "Computer Setup."

Security Preferences in Computer Setup

Most security preferences are set in Computer Setup. Because Computer Setup is a non-Windows utility, it does not support the pointing devices on your notebook. When using Computer Setup, you must use the keys on your notebook to navigate and make selections.

For more details, refer to Chapter 9, "Computer Setup."

Passwords

Most security features use passwords. Whenever you set a password, write down the password and store it in a secure location away from the notebook.

■ If you forget your power-on password and your HP administrator password, you cannot start up the notebook or restore from hibernation. Call Customer Care or your authorized service partner for additional information.

■ If you forget your HP administrator password, you will not be able to access Computer Setup.

■ If you forget the DriveLock user password but know the DriveLock master password, you can remove DriveLock protection from the drive.

  For instructions, refer to the "DriveLock" section in this chapter.

HP and Windows Passwords

HP security features and Windows operating system security features work independently from one another. For example, a device disabled in Computer Setup cannot be enabled in Windows.

Some password options are provided by your HP software, and others are provided by your operating system. HP passwords and Windows passwords are also independent of one another. The following table lists the different passwords used by HP and Windows and describes their functions.

For additional information about Windows passwords, such as screen-saver passwords, refer to **Start** > **Help and Support.**

HP Passwords	Function
HP administrator password	Protects access to Computer Setup.
Power-on password	Used to access the notebook during startup and when you restart the notebook.
DriveLock master password	Used by the HP administrator to access drives protected by DriveLock and to remove DriveLock protection from the drive.
DriveLock user password	Used by the day-to-day user to access drives protected by DriveLock at startup.
Smart card PIN	Used for smart card authentication.
	Power-on and HP administrator passwords can be stored on smart cards if an optional smart card reader supports this functionality. You must enable the smart card security feature in Computer Setup, and then enable a PIN in ProtectTools Security Manager (select models only). Refer to the "ProtectTools Security Manager (Select Models Only)" section in this chapter for more information.
Windows Passwords	**Function**
Administrator password*	Protects Windows administrator-level access to notebook contents.
User password*	Protects access to notebook contents after exit from standby.

*For information about setting a Windows administrator password or a Windows user password, select **Start > Help and Support.**

HP and Windows Password Guidelines

HP and Windows passwords are not interchangeable. You must use an HP password at an HP password prompt and a Windows password at a Windows password prompt. For example:

■ If a power-on password is set, the power-on password (not a Windows password) must be entered when the notebook starts up or restores from hibernation.

■ If you set Windows to prompt for a password before resuming from standby, a Windows password (not a power-on password) must be entered to resume from standby.

The same word or series of letters or numbers used for an HP password can be used for another HP password or for a Windows password, with the following considerations:

■ HP passwords can be any combination of up to 32 letters and numbers and are not case sensitive.

■ An HP password must be set and entered with the same type of keys. For example, an HP password set with keyboard number keys will not be recognized if it is entered with embedded numeric keypad number keys.

   For information about the embedded numeric keypad, refer to the "Keypads" section in Chapter 3, "TouchPad and Keyboard."

Although you can use the same text for various passwords, HP passwords and Windows passwords function independently. Even if you plan to use the same text for an HP password and a Windows password, you must set the HP password in Computer Setup and the Windows password in your operating system.

✎ Although their names are similar, an HP administrator password and a Windows administrator password have different functions. For example, a Windows administrator password cannot be used to access Computer Setup, and an HP administrator password cannot provide administrator-level access to your notebook contents. You can, however, use the same text for both passwords.

HP Administrator Passwords

The HP administrator password protects the configuration settings and system identification information in Computer Setup. After this password is set, it must be entered to access Computer Setup.

The HP administrator password

■ Is not interchangeable with a Windows administrator password, although both can use the same word or series of letters, or numbers.

■ Does not display as it is set, entered, changed, or deleted.

■ Must be set and entered with the same type of keys. For example, an HP administrator password set with keyboard number keys will not be recognized if you enter it with embedded numeric keypad number keys.

■ Can include any combination of up to 32 letters and numbers and is not case sensitive.

Setting HP Administrator Passwords

An HP administrator password is set, changed, or deleted in Computer Setup.

To manage the password:

1. Open Computer Setup by turning on the notebook. Press **f10** while the F10 = ROM Based Setup message is displayed in the lower-left corner of the screen.

   ❑ To change the language, press **f2.**

   ❑ For navigation instructions, press **f1.**

2. Use the arrow keys to select **Security > Administrator password,** and then press **enter.**

   ❑ To set an HP administrator password, type your password in the New password and Verify new password fields, and then press **f10.**

   ❑ To change an HP administrator password, type your current password in the Old password field, type the new password in the New password and Verify new password fields, and then press **f10.**

   ❑ To delete an HP administrator password, type your current password in the Old password field, and then press **f10.**

3. To save your preferences and exit Computer Setup, use the arrow keys to select **File > Save Changes and Exit.** Then follow the instructions on the screen.

Your preferences are in effect when the notebook restarts.

Entering HP Administrator Passwords

At the Administrator Password prompt, type your administrator password (using the same kind of keys you used to set the password), and then press enter. After 3 unsuccessful attempts to enter the HP administrator password, you must restart the notebook and try again.

Power-On Passwords

A power-on password prevents unauthorized use of the notebook.
After this password is set, it must be entered each time the
notebook is turned on or restarted. A power-on password

■ Does not display as it is set, entered, changed, or deleted.

■ Must be set and entered with the same type of keys. For
example, a power-on password set with keyboard number
keys will not be recognized if you enter it with embedded
numeric keypad number keys.

■ Can include any combination of up to 32 letters and numbers
and is not case sensitive.

Setting Power-On Passwords

A power-on password is set, changed, or deleted in Computer
Setup.

To manage the password:

1. Open Computer Setup by turning on the notebook. Press **f10**
   while the F10 = ROM Based Setup message is displayed in
   the lower-left corner of the screen.

   ❏ To change the language, press **f2.**

   ❏ For navigation instructions, press **f1.**

2. Use the arrow keys to select **Security > Power-On
   password,** and then press **enter.**

   ❏ To set a power-on password, type the password in the
   New password and Verify new password fields, and then
   press **f10.**

❏ To change a power-on password, type the current password in the Old password field, type the new password in the New password and Verify new password fields, and then press **f10.**

❏ To delete a power-on password, type the current password in the Old password field, and then press **f10.**

3. To save your preferences, use the arrow keys to select **File > Save Changes and Exit.** Then follow the instructions on the screen.

Your preferences are in effect when the notebook restarts.

Entering Power-On Passwords

At the power-on password prompt, type your password, and then press **enter.** After 3 unsuccessful attempts to enter the password, you must restart the notebook and try again.

Requiring a Power-On Password at Restart

You can require that a power-on password be entered each time the notebook is restarted. Enable and disable this feature in Computer Setup:

1. Open Computer Setup by turning on the notebook. Press **f10** while the F10 = ROM Based Setup message is displayed in the lower-left corner of the screen.

   ❏ To change the language, press **f2.**

   ❏ For navigation instructions, press **f1.**

2. Use the arrow keys to select **Security > Password options > Require password on restart.**

3. Toggle the field to enable or disable, and then press **enter.**

4. Save your preferences by using the arrow keys to select **File > Save Changes and Exit.** Then follow the instructions on the screen.

Your preferences are in effect when the notebook restarts.

DriveLock

△ **CAUTION:** If you forget both the DriveLock user password and the DriveLock master password, the hard drive is permanently locked and can no longer be used.

DriveLock prevents unauthorized access to the contents of a hard drive. After DriveLock protection is applied to a drive, a password must be entered to access the drive. The drive must be inserted into the notebook, not into an optional docking device (select models only) or external MultiBay, in order for it to be accessed by the DriveLock passwords.

DriveLock requires a user password and a master password defined in Computer Setup:

■ A hard drive protected by DriveLock can be accessed with either the user password or the master password.

■ You can delete a user password or master password only by removing DriveLock protection from the drive. DriveLock protection can be removed from the drive only with the master password.

■ The owner of the user password should be the day-to-day user of the protected hard drive. The owner of the master password may be a system administrator or the day-to-day user.

■ A user password and a master password can be the same word.

✎ When you start the notebook from a hard drive protected with DriveLock, and your power-on password and DriveLock password are identical, you will be prompted to enter only a power-on password instead of both a power-on password and a DriveLock password.

Setting DriveLock Passwords

To access the DriveLock settings in Computer Setup:

1. Shut down the notebook. If you are not sure whether the notebook is off or in hibernation, turn the notebook on by pressing the power button, and then shut down the notebook through the operating system.

2. Be sure that the hard drive is inserted into the notebook (not into an optional docking device or external MultiBay).

3. Open Computer Setup by turning on the notebook. Press **f10** while the F10 = ROM Based Setup message is displayed in the lower-left corner of the screen.

   ❏ To change the language, press **f2.**

   ❏ For navigation instructions, press **f1.**

4. Use the arrow keys to select **Security > DriveLock passwords.** Then press **enter.**

5. Select the location of the hard drive, and then press **f10.**

6. Toggle the Protection field to **Enable,** and then press **f10.**

7. Read the warning. To continue, press **f10.**

8. Type your user password in the **New password** and **Verify new password** fields, and then press **f10.**

9. Type your master password in the **New password** and **Verify new password** fields, and then press **f10.**

10. To confirm DriveLock protection on the drive you have selected, type DriveLock in the confirmation field, and then press **f10.**

11. To save your DriveLock settings, select **File > Save Changes and Exit.** Then follow the instructions on the screen.

Your preferences are in effect when the notebook restarts.

Entering DriveLock Passwords

1. Be sure that the hard drive is inserted into the notebook (not into an optional docking device or external MultiBay).

2. When prompted for a DriveLock password, type your user or master password (using the same kind of keys you used to set the password), and then press **enter.**

✎ After 2 incorrect attempts to enter the password, you must restart the notebook and try again.

Requiring a Drivelock Password at Restart

You can require that a DriveLock password be entered each time the notebook is restarted. Enable and disable this feature in Computer Setup:

1. Shut down the notebook. If you are not sure whether the notebook is off or in hibernation, turn the notebook on by pressing the power button, and then shut down the notebook through the operating system.

2. Be sure that the hard drive is inserted into the notebook (not into an optional docking device or external MultiBay).

3. Open Computer Setup by turning on the notebook. Press **f10** while the F10 = ROM Based Setup message is displayed in the lower-left corner of the screen.

   ❏ To change the language, press **f2.**
   ❏ For navigation instructions, press **f1.**

4. Use the arrow keys to select **Security > Password options > Require password on restart.**

5. Toggle the field to enable or disable, and then press **enter.**

6. Save your preferences by using the arrow keys to select **File > Save Changes and Exit.** Then follow the instructions on the screen.

Your preferences are in effect when the notebook restarts.

Changing DriveLock Passwords

To access the DriveLock settings in Computer Setup:

1. Shut down the notebook. If you are not sure whether the notebook is off or in hibernation, turn the notebook on by pressing the power button, and then shut down the notebook through the operating system.

2. Be sure that the hard drive is inserted into the notebook (not into an optional docking device or external MultiBay).

3. Open Computer Setup by turning on the notebook. Press **f10** while the F10 = ROM Based Setup message is displayed in the lower left of the screen.

   ❏ To change the language, press **f2.**

   ❏ For navigation instructions, press **f1.**

4. Use the arrow keys to select **Security > DriveLock passwords,** and then press **enter.**

5. Use the arrow keys to select the location of the hard drive, and then press **f10.**

6. Use the arrow keys to select the field for the password you want to change. Type your current password in the **Old password** field, and then type the new password in the **New password** field and in the **Verify new password** field. Then press **f10.**

7. To save your preferences, use arrow keys to select **File > Save Changes and Exit,** and then follow the instructions on the screen.

Your preferences are in effect when the notebook restarts.

Removing DriveLock Protection

To access the DriveLock settings in Computer Setup:

1. Shut down the notebook. If you are not sure whether the notebook is off or in hibernation, turn the notebook on by pressing the power button, and then shut down the notebook through the operating system.

2. Be sure that the hard drive is inserted into the notebook (not into an optional docking device or external MultiBay).

3. Open Computer Setup by turning on the notebook. Press **f10** while the F10 = ROM Based Setup message is displayed in the lower-left corner of the screen.

   ❏ To change the language, press **f2.**

   ❏ For navigation instructions, press **f1.**

4. Use the arrow keys to select **Security > DriveLock passwords,** and then press **enter.**

5. Use the arrow keys to select the location of the hard drive, and then press **f10.**

6. Toggle the Protection field to Disable, and then press **f10.**

7. Type your master password in the **Old password** field. Then press **f10.**

8. To save your preferences, use the arrow keys to select **File > Save Changes and Exit.** Then follow the instructions on the screen.

Your preferences are in effect when the notebook restarts.

Device Security

From the Computer Setup Device Security menu, you can disable or partially disable most ports and drives.

To disable or reenable notebook capabilities in Computer Setup:

1. Open Computer Setup by turning on the notebook. Press **f10** while the F10 = ROM Based Setup message is displayed in the lower-left corner of the screen.

   ❏ To change the language, press **f2.**

   ❏ For navigation instructions, press **f1.**

2. Select **Security > Device security,** and then enter your preferences.

3. To confirm your preferences, press **f10.**

4. To save your preferences, select **File > Save Changes and Exit.** Then follow the instructions on the screen.

Your preferences are in effect when the notebook restarts.

System Information

The System Information setting provides details about your notebook and battery pack. The following sections explain how to prevent other users from viewing system information and how to configure system information options in Computer Setup.

System Information options allow you to

■ Display or enter the notebook serial number, asset tag, and ownership tag.

■ Display a battery pack serial number.

✎ To prevent unauthorized access to this information, you must create an HP administrator password. For instructions, refer to the "Setting HP Administrator Passwords" section earlier in this chapter.

Setting System Information Options

1. Open Computer Setup by turning on the notebook. Press **f10** while the F10 = ROM Based Setup message is displayed in the lower-left corner of the screen.

   ❏ To change the language, press **f2.**

   ❏ For navigation instructions, press **f1.**

2. Access or set your preferences by following these directions:

   ❏ To view general system information, select **File > System Information.**

   ❏ To view or enter identification values for system components, select **Security > System IDs.**

3. To confirm the information or your preferences, press **f10.**

4. To save your information or preferences, use the arrow keys to select **File > Save Changes and Exit,** and then follow the instructions on the screen.

Your preferences are in effect when the notebook restarts.

Antivirus Software

When you use the notebook for e-mail, network, or Internet access, you expose the notebook to computer viruses. Computer viruses can disable your operating system, applications, or utilities, or cause them to function abnormally.

Antivirus software can detect most viruses, destroy them, and in most cases, repair damage they have caused. To provide protection against newly discovered viruses, antivirus software must be updated.

Norton AntiVirus is preinstalled on the notebook. For information about using the Norton AntiVirus software:

» Select **Start > All Programs > Norton AntiVirus > Help and Support.**

For more information about computer viruses:

1. Select **Start > Help and Support.**
2. Type viruses into the **Search** field.
3. Press **enter.**

Firewall Software

When you use the notebook for e-mail, network, or Internet access, it is possible for unauthorized persons to obtain information about you, your notebook, and your data. Firewalls monitor traffic on your computer by including features such as logging and reporting, automatic alarms, and user interfaces for configuring the firewall. To protect your privacy, it is recommended that you use firewall software.

The Windows operating system firewall is available on your notebook. To learn more about this firewall:

1. Select **Start > Control Panel > Network and Internet Connections > Windows Firewall.**

2. Select the **General** tab.

   ❏ To learn more about Windows Firewall, select the **What else should I know about Windows Firewall?** link.

   ❏ To disable Windows Firewall, select **Off (not recommended).**

   ❏ To reenable Windows Firewall, select **On (recommended).**

3. Select **OK.**

Under some circumstances a firewall can block access to Internet games, interfere with printer or file sharing on a network, or block authorized e-mail attachments. If you are using Windows Firewall and an application attempts an inbound connection to your notebook for the first time, a security alert will be displayed. The security alert allows you to configure the firewall permission for the application.

■ To allow the application to connect to your notebook, select **Unblock this program.** The application is added to the Exceptions list and will not be blocked by Windows Firewall.

■ To permanently block the application, select **Keep blocking this program.** Windows Firewall will block the application anytime the application tries to connect.

■ To temporarily block the application, select **Keep blocking this program, but ask me again later.** The next time the application attempts to connect to your notebook, you will receive the security alert.

To manually add an application to the Windows Firewall Exceptions list so that it will not be blocked by the firewall:

1. Select **Start > Control Panel > Network and Internet Connections > Windows Firewall.**

2. Select the **Exceptions** tab.

3. Select **Add Program** and enter the required information about the application.

4. Select **OK.** The application is added to the Exceptions list and will not be blocked by Windows Firewall.

If you are using an optional firewall and you want to allow a blocked application to connect:

■ Temporarily solve the problem by disabling the firewall, performing the task, and then reenabling the firewall.

■ Permanently resolve the problem by reconfiguring the firewall. Refer to the firewall documentation or contact the firewall manufacturer.

Critical Security Updates for Windows XP

Ⓒ **CAUTION:** Because new computer viruses are being detected all the time, it is recommended that you install all critical updates as soon as you receive an alert from Microsoft. You should also run Windows Update on a monthly basis to install the latest recommended updates from Microsoft.

A *Critical Security Updates for Windows XP* disc may have been included with your notebook to provide additional updates delivered after the computer was configured. Microsoft will continue to update the operating system and make these updates available on their Web site.

To update your system using the *Critical Security Updates for Windows XP* disc:

1. Insert the disc into the drive. The disc automatically runs the installation application.

2. Follow the on-screen instructions to install all updates. This may take a few minutes.

3. Remove the disc.

ProtectTools Security Manager (Select Models Only)

ProtectTools Security Manager is accessed through Microsoft Windows Control Panel. It provides security features that are designed to help protect against unauthorized access to the notebook, networks, and critical data. Add-on modules for ProtectTools Security Manager include the following:

■ Credential Manager for ProtectTools

■ BIOS Configuration for ProtectTools

■ Smart Card Security for ProtectTools

Depending on your notebook model, add-on modules may be preinstalled, preloaded, or downloaded from the HP Web site. Visit http://www.hp.com for more information.

Credential Manager for ProtectTools

Credential Manager for ProtectTools has security features that provide protection against unauthorized access to your notebook, including the following:

■ Alternatives to passwords when logging on to Microsoft Windows, such as using a smart card to log on to Windows.

■ Single sign-on capability that automatically remembers credentials for Web sites, applications, and protected network resources.

■ Support for optional security devices, such as smart cards and biometric fingerprint readers.

For more information, refer to the Credential Manager for ProtectTools online Help.

BIOS Configuration for ProtectTools

BIOS Configuration for ProtectTools provides access to BIOS security and configuration settings within the ProtectTools Security Manager application, which gives users better access to system security features that are managed by the system BIOS.

With BIOS Configuration for ProtectTools, you can

■ Manage power-on user passwords and administrator passwords.

■ Configure preboot authentication features, such as smart card passwords and power-on passwords.

■ Enable and disable hardware features (such as the enable CD-ROM boot feature).

■ Configure boot options, which includes disabling the ability to boot to drives other than the primary hard drive.

✎ Many of the features in BIOS Configuration for ProtectTools are also available in Computer Setup. Refer to Chapter 9, "Computer Setup" for additional information.

For more information, refer to the BIOS Configuration for ProtectTools online Help.

Smart Card Security for ProtectTools

With Smart Card Security for ProtectTools, you can

■ Access optional smart card security features. Security enhancements are supported by the optional ProtectTools Smart Card and an optional supported reader, such as a smart card reader.

■ Initialize an optional ProtectTools Smart Card so that it can be used with Credential Manager for ProtectTools.

■ Work with the BIOS to enable optional smart card authentication in a preboot environment, and to configure separate smart cards for an administrator and a user. This requires a user to insert the smart card and optionally enter a PIN prior to allowing the operating system to load.

For more information on BIOS security features, refer to Chapter 9, "Computer Setup."

■ Set and change the password used to authenticate users of the optional smart card.

■ Back up and restore credentials stored on the optional smart card.

For more information, refer to the Smart Card Security for ProtectTools online Help.

Optional Security Cable

✎ Security solutions are designed to act as deterrents. These deterrents may not prevent a product from being mishandled or stolen.

To install a security cable:

1. Loop the security cable around a secured object.
2. Insert the key ❶ into the cable lock ❷.
3. Insert the cable lock into the security cable slot ❸, and then lock the cable lock with the key.

8
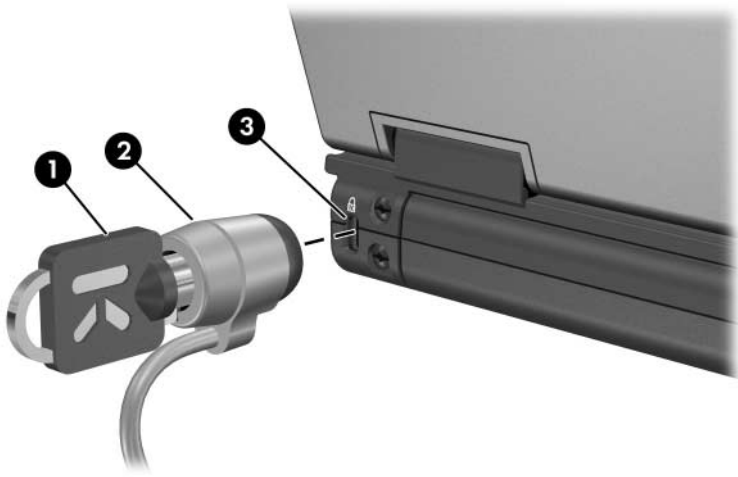
MultiBoot

A bootable medium or network interface card (NIC) contains files that the notebook needs to start and operate properly. The MultiBoot utility, disabled by default, enables you to identify those devices and control the sequence in which the system attempts to boot from those devices, as it starts up your notebook.

Bootable devices include optical drive discs, such as CDs or DVDs, bootable diskettes, or a NIC.

✎ Some devices, including USB devices and NICs, must be enabled in Computer Setup before they can be included in the boot sequence. For more information, refer in this chapter to "Enabling Bootable Devices in Computer Setup."

About the Default Boot Sequence

By default, when more than one bootable device is in the system, the notebook chooses the startup device by searching enabled devices and locations in a predetermined sequence.

On every boot, the system looks for bootable drive A devices first. If it fails to find a bootable drive A device, it searches for bootable drive C devices. Drive A devices include optical drives and diskette drives. Drive C devices include optical drives and primary hard drives.

The hard drive can only boot as drive C. The NIC does not have a drive letter assigned to it.

✎ An optical drive device (such as a CD-ROM) can boot either as drive A or drive C, depending on the format of the CD. Most bootable CDs boot as drive A. If you have a CD that boots as the C drive, the system will boot the diskette drive before it boots the CD.

By default, the notebook selects the startup device by searching enabled devices and locations in a predetermined sequence.

You can change the sequence in which the notebook searches for a startup device by enabling MultiBoot and entering a new startup sequence, also called a *boot order*. Or, you can use MultiBoot Express to set the notebook to prompt you for a startup location each time the notebook is started or restarted.

The list below describes the default sequence in which drive numbers are assigned. (The actual startup sequence varies by configuration.)

■ Default sequence for devices that boot as drive A:

1. Optical drive in an optional docking device (select models only) or in an external MultiBay that contains a disc that boots as drive A.

2. Optical drive in the internal MultiBay that contains a disc that boots as drive A.

3. Diskette drive in an optional docking device (select models only) or in an external MultiBay.

■ Default sequence for devices that boot as drive C:

1. An optical drive in an optional docking device (select models only) or in an external MultiBay that contains a disc that boots as drive C.

2. Optical drive in the internal MultiBay that contains a disc that boots as drive C.

3. Hard drive in the notebook hard drive bay.

4. Hard drive in an optional docking device (select models only) or in an external MultiBay.

✎ Since no drive letter is associated with the NIC, changing the boot order of a NIC does not affect drive letters of the other devices.

Enabling Bootable Devices in Computer Setup

The notebook can start up from a USB device or the NIC only if that device has been enabled for inclusion in the boot sequence.

To enable a device or location for inclusion in MultiBoot:

1. Open Computer Setup by turning on or restarting the notebook. Press **f10** while the F10 = ROM Based Setup message is displayed in the lower-left corner of the screen.

   ❏ To change the language, press **f2.**

   ❏ For navigation instructions, press **f1.**

2. To enable bootable media in USB drives or in drives inserted into an optional docking device (select models only), use the arrow keys to select the **Advanced** menu > **Device Options.** Then select **Enable USB legacy support.**

   – or –

   To enable a NIC, select the **Security** menu > **Device Security,** and then select Internal network adapter boot.

3. Save your preferences and exit Computer Setup by using the arrow keys to select **File > Save Changes and Exit.** Then follow the instructions on the screen.

Your preferences are set when you exit Computer Setup, and they take effect when the notebook restarts.

✎ To connect a NIC to a Preboot eXecution Environment (PXE) or Remote Program Load (RPL) server during startup without using MultiBoot, quickly press **f12** when the Network Service Boot message appears in the lower-right corner of the screen (select models only).

Understanding MultiBoot Results

Before changing the startup sequence, consider the following:

■ When the notebook restarts after the boot order has been changed, it considers only the first of each type of device (except for optical devices). For example, the notebook is connected to an optional docking device (select models only) that contains a hard drive. This hard drive will be shown in the boot order in Computer Setup as USB hard disk. If this drive is placed before the hard drive in the hard drive bay in the boot order, and if the system fails to boot to the drive in an optional docking station, it will not attempt to boot to the hard drive in the hard drive bay. Instead, it will try to boot to the next type of device in the boot order (diskette, optical device, or NIC). However, if there are 2 optical devices, and the first optical device does not boot (either because it does not contain media or the media is not bootable), the system will try to boot to the second optical device.

■ Changing the boot sequence also changes the logical drive designations. For example, if you start up from a CD-ROM drive with a disc that boots as drive C, that CD-ROM drive becomes drive C and the hard drive in the hard drive bay becomes drive D.

■ Starting up from a NIC does not affect logical drive designations because no drive letter is associated with the NIC.

■ Drives in an optional docking device (select models only) are treated like external USB devices in the boot sequence and must be enabled in Computer Setup.

Setting MultiBoot Preferences

There are 2 ways to set MultiBoot sequences:

■ Set a new default boot sequence that the notebook uses each time it starts up.

■ Use variable boot sequences using MultiBoot Express. This feature prompts you for a startup device each time the notebook is started or restarted.

Setting a New Default Boot Sequence

To set a startup sequence that the notebook uses each time it is started or restarted:

1. Open Computer Setup by turning on or restarting the notebook. Press **f10** while the F10 = ROM Based Setup message is displayed in the lower-left corner of the screen.

   ❏ To change the language, press **f2.**

   ❏ For navigation instructions, press **f1.**

2. Use the arrow keys to select the **Advanced** menu > **Boot Options,** and then press **enter.**

3. Toggle the MultiBoot field to **Enable.**

4. Toggle the Boot Order fields to the boot sequence that you prefer.

5. Save your preferences and exit Computer Setup, by using the arrow keys to select **File > Save Changes and Exit,** and then follow the instructions on the screen.

Your preferences are set when you exit Computer Setup, and they take effect when the notebook restarts.

Setting a MultiBoot Express Prompt

To set the notebook to display the MultiBoot startup location menu each time the notebook is started or restarted:

1. Open Computer Setup by turning on or restarting the notebook. Press **f10** while the F10 = ROM Based Setup message is displayed in the lower-left corner of the screen.

   ❏ To change the language, press **f2.**

   ❏ For navigation instructions, press **f1.**

2. Use the arrow keys to select the **Advanced** menu > **Boot Options,** and then press **enter.**

3. In the Express Boot Popup Delay (Sec) field, select the length of time in seconds that you want the notebook to display the startup location menu before it defaults to the current MultiBoot setting (when 0 is selected, the Express Boot startup location menu is not displayed.)

4. Save your preferences and exit Computer Setup, by using the arrow keys to select **File > Save Changes and Exit,** and then follow the instructions on the screen.

Your preferences are set when you exit Computer Setup, and they take effect when the notebook restarts.

Entering MultiBoot Express Preferences

When the Express Boot Menu is displayed during startup:

■ To specify a startup location from the Express Boot menu, select your preference within the allotted time, and then press **enter.**

■ To prevent the notebook from defaulting to the current MultiBoot setting, press any key before the allotted time expires. The notebook will not start up until you select a startup location and press **enter.**

■ To allow the notebook to start up according to the current MultiBoot settings, wait for the allotted time to expire.

9

Computer Setup

Using Computer Setup

Computer Setup is a preinstalled, ROM-based utility that can be used even when the operating system is not working or will not load. If the operating system is working, the notebook restarts the operating system after you exit Computer Setup.

✎ Pointing devices are not supported in Computer Setup; you must use the keyboard to navigate and make selections.

✎ An external keyboard connected by USB can be used with Computer Setup only if USB legacy support is enabled. For more information about USB, refer to the "Connecting a USB Device" section in the "Hardware Components" chapter in this guide.

The menu tables later in this chapter provide an overview of Computer Setup options.

Accessing Computer Setup

The information and settings in Computer Setup are accessed from the File, Security, Tools, and Advanced menus.

1. Open Computer Setup by turning on or restarting the notebook. Press **f10** while the F10 = ROM Based Setup message is displayed in the lower left of the screen.

   ❏ To change the language, press **f2.**

   ❏ To view navigation information, press **f1.**

   ❏ To return to the Computer Setup menu, press **esc.**

2. Select the **File, Security, Tools,** or **Advanced** menu.

3. To exit Computer Setup, choose one of the following:

   ❏ To exit without saving any changes, use the arrow keys to select **File > Ignore Changes and Exit,** and then follow the instructions on the screen.

   ❏ To exit and save all the settings you have entered, use the arrow keys to select **File > Save Changes and Exit,** and then follow the instructions on the screen.

Your preferences are set when you exit Computer Setup and take effect when the notebook restarts.

Restoring Computer Setup Defaults

To return all settings in Computer Setup to the values that were set at the factory:

1. Open Computer Setup by turning on or restarting the notebook. Press **f10** while the F10 = ROM Based Setup message is displayed in the lower-left corner of the screen.

   ❏ To change the language, press **f2.**

   ❏ To view navigation information, press **f1.**

2. Use the arrow keys to select **File > Restore defaults.**

3. Select the **Restore Defaults** check box.

4. To confirm the restoration, press **f10.**

5. Select **File > Save Changes and Exit,** and then follow the instructions on the screen.

When the computer restarts, the factory settings are restored, and any identification information you may have entered is saved.

Selecting from the File Menu

Select	To Do This
System information	■ View identification information about the notebook, including the notebook serial number. ■ View specification information about the processor, cache and memory size, and system ROM.
Save to floppy	Save system configuration settings to a diskette.
Restore from floppy	Restore system configuration settings from a diskette.
Restore defaults	Replace configuration settings in Computer Setup with factory default settings. (Identification information is retained.)
Ignore changes and exit	Cancel changes entered during the current session. Then exit and restart the notebook.
Save changes and exit	Save changes entered during the current session. Then exit and restart the notebook. The changes you save are in effect when the notebook restarts.

Selecting from the Security Menu

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Select	To Do This
Administrator password	Enter, change, or delete an administrator password.
Power-On password	Enter, change, or delete a power-on password.
Password options	Enable/disable stringent security and password requirement on restart.
DriveLock passwords	Enable/disable DriveLock; change a DriveLock user or master password. ✎ DriveLock settings are accessible only when you enter Computer Setup by turning on (not restarting) the notebook.
Smart card security	Enable/disable support for smart card authentication on boot. ✎ This feature is supported only by certain smart card readers. Refer to Chapter 7, "Security" in this guide.
Device security	■ Enable/disable serial, infrared, and parallel ports, the wireless button, and the SD slot. ■ Enable/disable CD-ROM, floppy, and NIC boot. ■ Select NIC boot mode.
System IDs	Enter user-defined notebook asset and ownership tag.

Selecting from the Tools Menu

Select	To Do This
Battery Status	View battery status information.
HDD Self Test options	Run a quick or comprehensive self test on any hard drive in the system.
Memory Check	Run a comprehensive check on system memory.

Selecting from the Advanced Menu

Select	To Do This
Language (or press **f2**)	Change the Computer Setup language.
Boot options	■ Set F10 and F12 delay when starting up.
	■ Enable/disable MultiBoot, which sets a startup sequence that can include most bootable devices and media in the system. For details, refer to Chapter 8, "MultiBoot."
	■ Set the boot order.

(Continued)

Select	To Do This
Device options	■ Swap the functions of the **fn** key and left **ctrl** key.
	■ Enable/disable multiple standard pointing devices at startup. (To set the notebook to support only a single, usually nonstandard, pointing device at startup, select **Disable.**)
	■ Enable/disable USB legacy support for a USB keyboard, mouse, and hubs.
	❒ A USB keyboard, mouse, and hubs work even when a Windows operating system is not loaded.
	❒ The notebook starts from a bootable hard drive, diskette drive diskette, or CD-ROM, CD-RW, or DVD inserted into a drive connected by a USB port to the notebook or to an optional docking device (select models only).
	■ Select a parallel port mode: EPP (Enhanced Parallel Port), standard, bidirectional, or ECP (Enhanced Capabilities Port).
	■ Enable/disable all settings in the SpeedStep window. (When Disable is selected, the notebook runs in Battery Optimized mode.)
	■ Enable/disable system fan when connected to AC outlet.
	■ Enable/disable WLAN Device Radio.
	■ Enable/disable embedded Bluetooth Device Radio.
	■ Enable/disable LAN/WLAN switching.

10

Client Management Solutions

Client Management Solutions provide standards-based solutions for managing client (user) desktop, workstation, and notebook computers in a networked environment.

The key capabilities and features of client management are

- Initial software image deployment.

- Remote system software installation.

- Software management and updates.

- ROM updates.

- Tracking and security of computer assets (the hardware and software installed on the computer).

- Fault notification and recovery of certain system software and hardware components.

✎ Support for specific features described in this chapter may vary, depending on the computer model and/or version of management software installed on your computer.

Configuration and Deployment

HP computers come with a preinstalled system software image. The initial software image is configured during the first-time setup of the computer. After a brief software "unbundling" occurs, the computer is ready to be used.

A customized software image can be deployed (distributed) by

■ Installing additional software applications after unbundling the preinstalled software image.

■ Using software deployment tools, such as Altiris Deployment Solutions, to replace the preinstalled software with a customized software image.

■ Using a disk cloning process to copy the contents from one hard drive to another.

The deployment method you should use depends on your organization's technology environment and processes. Visit the HP Web site at http://www.hp.com/go/pcsolutions for more information on selecting the best deployment method for your organization.

✎ The system recovery discs, Computer Setup utility, and other system features provide further assistance with recovery of system software, configuration management and troubleshooting, and power management.

Client Manager Software

Client Manager Software (HP CMS) integrates HP Intelligent Manageability technology within Altiris software. HP CMS provides superior hardware management capabilities for HP devices. It provides

■ Detailed views of hardware inventory for asset management.

■ *PC health check* monitoring and diagnostics.

■ Web-accessible reporting of business critical details such as machines with thermal warnings, and memory alerts.

■ Remote updating of system software such as device drivers and ROM BIOS.

✎ Additional functionality can be added when HP CMS is used with optional Altiris Solutions software (purchased separately).

For more information on Client Manager, visit the HP Web site at http://www.hp.com/go/easydeploy.

11

Software Update and Recoveries

Preparing to Update Software

For optimal notebook performance and to make sure your notebook remains compatible with changing technologies, it is recommended that you install the latest versions of HP software as they become available.

To update HP software:

1. Prepare for any update by identifying your notebook type, series or family, and model. Refer to "Accessing Notebook Information" for information on obtaining your notebook type. Prepare for a system ROM update by identifying (through the Computer Setup utility) the ROM versions currently installed on the notebook.

2. Access the updates through your local HP Web site or the *Support Software* CD (purchased separately).

3. Download and install the updates.

✎ The notebook system ROM stores the BIOS. The BIOS determines how the notebook hardware interacts with the operating system and external devices and also supports such notebook services as time and date.

✎ If your notebook connects to a network, it is recommended that you consult with your network administrator before installing any software updates, especially system ROM updates.

Obtaining the Support Software CD

The *Support Software* CD provides HP software updates and installation instructions. The CD includes device drivers, ROM updates, and utilities.

To purchase the current *Support Software* CD or a subscription that provides both the current version and future versions of the CD, visit the HP Web site at http://www.hp.com.

Accessing Notebook Information

To access the updates for your notebook, the following information will be needed:

■ The product *category* is Notebook.

■ The product *family* name and *series* number are printed in the lower-right corner of the display bezel.

■ *Model* information is provided on the serial number label on the bottom of the notebook.

To determine whether available ROM updates contain later ROM versions than those currently installed on the notebook, you need to know the version of the system ROM currently installed.

ROM version information can be displayed in Computer Setup. For information about using Computer Setup, refer to Chapter 9, "Computer Setup."

To display ROM information in Computer Setup:

1. Open Computer Setup by turning on or restarting the notebook. Press **f10** while the F10 = ROM Based Setup message is displayed in the lower left of the screen.

   ❏ To change the language, press **f2.**

   ❏ For navigation instructions, press **f1.**

2. Select **File > System Information.** The system ROM information is displayed.

3. To exit Computer Setup without changing any settings, use the arrow keys to select **File > Ignore Changes and Exit,** and then follow the instructions on the screen. After Computer Setup closes, the notebook restarts in Windows.

Downloading Software from the Internet

Most software on the HP Web site is packaged in compressed files called *SoftPaqs.* Some ROM updates may be packaged in compressed files called *ROMPaqs.* Other ROM updates may be provided as CPQFlash SoftPaqs.

Most download packages contain a file named Readme.txt. A Readme.txt file contains information regarding installing and troubleshooting the file. The Readme.txt files included with ROMPaqs are in English.

Downloading System ROM

△ **CAUTION:** To prevent an unsuccessful installation, download and install the system ROM only while the notebook is connected to reliable external power using the AC adapter. Do not download or install the system ROM while the notebook is running on battery power, docked in an optional Port Replicator, or connected to an optional power source. During the download and installation:

■ Do not unplug the notebook from the electrical outlet.

■ Do not shut down the notebook.

■ Do not remove or insert a drive.

To download and install a system ROM:

1. Access the page on the HP Web site that provides software for your notebook.

2. Follow the instructions on the screen to locate the system ROM you want to download.

3. At the download area:

   a. Write down the information (date and name) of any update that is later than the system ROM currently installed on your notebook.

   b. Select the software you want and follow the download instructions on the screen.

4. When the download is complete, open Windows Explorer.

5. In Windows Explorer, select **My Computer,** and then the hard drive designation (usually drive C), and then the folder to which you saved the downloaded item.

6. In the folder, select the name or number of the software package containing the system ROM update. The system ROM installation begins.

7. To complete the installation, follow the instructions on the screen.

✎ After a message on the screen reports a successful installation, you can delete the download package from the folder.

Downloading Other Software

To download and install other software:

1. Access the page at the HP Web site that provides software for your notebook.

2. Follow the instructions on the screen to find the software you want to update.

3. At the download area, select the software you want and follow the downloading instructions on the Web page.

4. When the download is complete, open Windows Explorer.

5. In Windows Explorer, select **My Computer,** and then the hard drive designation (usually drive C), and then the folder to which you saved the downloaded item.

6. In the folder, select the name or number of the software package containing the update.

7. Select the file that includes an .exe extension, for example, Filename.exe. (The installation begins.)

8. To complete the installation, follow the instructions on the screen.

✎ After a message on the screen reports a successful installation, you can delete the download package from the folder.

System Recovery

The notebook system recovery process provides several ways to recover system functionality. The *Application and Driver Recovery* disc enables you to recover or repair your notebook without losing personal data. The *Operating System* disc also allows you to reinstall the operating system software provided with the notebook.

✎ For best results, attempt to recover optimal notebook functionality by using the following procedures *in the order described here.*

Safeguarding Your Data

Software or devices added to the notebook can cause your system to become unstable. To safeguard your documents, store personal files in the My Documents folder and periodically create a backup copy of My Documents.

Setting System Restore Points

Notebooks with Windows XP operating systems provide the option of setting System Restore points (benchmarks) daily as you change your personal settings. The notebook may also set restore points when you add new software or devices. You should periodically set system restore points when the notebook is functioning at optimal performance and before installing new software or devices. This enables you to return to a previous configuration restore point if you encounter problems.

To set a system restore point:

1. Select **Start > Help and Support > System Restore.** (The System Restore window opens.)

2. Follow the on-screen directions for setting a restore point.

To restore the notebook to a previous date and time when it was functioning optimally:

1. Select **Start > Help and Support > System Restore.**(The System Restore window opens.)

2. Follow the on-screen directions for restoring the notebook.

Repairing the Operating System

To attempt an operating system repair without deleting your personal data, use the *Operating System* disc that was shipped with the notebook:

1. Connect the notebook to external power and turn on the notebook.

2. Immediately insert the *Operating System* disc into the notebook.

3. Press and hold the power button for 5 seconds to turn off the notebook.

4. Press the power button again to start the notebook.

5. When prompted, press any key to boot from the disc. (After a few minutes, the Welcome to Setup screen is displayed.)

6. Press **enter** to continue. (A Licensing Agreement screen is displayed.)

7. Press **f8** to accept the agreement and continue. (The Setup window is displayed.)

8. Press **R** to repair the selected Windows installation. (The repair process begins. This process may take 1–2 hours to complete. The notebook restarts in Windows after the process is complete.)

Reinstalling the Operating System

∆ **CAUTION:** Personal data and software you have installed on the notebook will be lost during the operating system reinstall. To protect your data, back up your data before reinstalling your operating system. See the Windows online Help utility to learn more about backing up your files.

If other recovery efforts do not successfully repair the notebook, you can reinstall the operating system.

To reinstall the operating system:

1. Connect the notebook to external power and turn on the notebook.

2. Immediately insert the *Operating System* disc into the notebook.

3. Press and hold the power button for 5 seconds to turn off the notebook.

4. Press the power button again to start the notebook.

5. When prompted, press any key to boot from the disc. (After a few minutes, the Welcome to Setup screen is displayed.)

6. Press **enter** to continue. (A Licensing Agreement screen is displayed.(

7. Press **f8** to accept the agreement and continue. (The Setup window is displayed.)

8. Press **esc** to continue installing a new copy of the operating system instead of repairing it.

9. Press **enter** to set up the operating system.

10. Press **C** to continue setup using this partition.

11. Select **Format the partition using the NTFS file system (Quick),** and then press **enter.**

⚠ Formatting this drive will delete all current files.

12. Press **F** to format the drive. (The reinstallation process begins. This process may take 1–2 hours to complete. The notebook restarts in Windows when the process is complete.)

✎ When prompted for the Product Key, refer to the Microsoft Certificate of Authenticity label located on the bottom of the notebook.

Reinstalling Device Drivers and Other Software

After the operating system installation process is complete, you must reinstall drivers.

To reinstall drivers, use the *Application and Driver Recovery* disc included with the notebook:

1. While running Windows, insert the *Application and Driver Recovery* disc into the optical drive.

   If you do not have Autorun enabled, select **Start > Run.** Then type D:\SWSETUP\APPINSTL\SETUP.EXE (where *D* indicates the optical drive).

2. Follow the on-screen instructions for installing the drivers.

After the drivers are reinstalled, you must reinstall any software you added to the notebook. Follow the installation instructions provided with the software.

12

Specifications

Operating Environment

The operating environment information in the following table might be helpful if you plan to use or transport the notebook in extreme environments.

Factor	Metric	U.S.
Temperature		
Operating (not writing to optical disc	0°C to 35°C	32°F to 95°F
Operating (writing to optical disc)	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity (noncondensing)		
Operating	10% to 90%	10% to 90%
Nonoperating	5% to 95%	5% to 95%
Maximum altitude (unpressurized)		
Operating (14.7 to 10.1 psia)	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating (14.7 to 4.4 psia)	-15 m to 12,192 m	-50 ft to 40,000 ft

Rated Input Power

The power information in this section might be helpful if you plan to travel internationally with the notebook.

The notebook operates on DC power, which can be supplied by an AC or a DC power source. Although the notebook can be powered from a stand-alone DC power source, it is strongly recommended that the notebook be powered only with an AC adapter or DC power cord supplied or approved by HP.

The notebook is capable of accepting DC power within the following specifications:

Input Power	Rating
Operating voltage	18.5 V dc @ 3.5 A - 65 W
Operating current	3.5 A

This product is designed for IT power systems in Norway with phase-to-phase voltage not exceeding 240 Vrms.

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